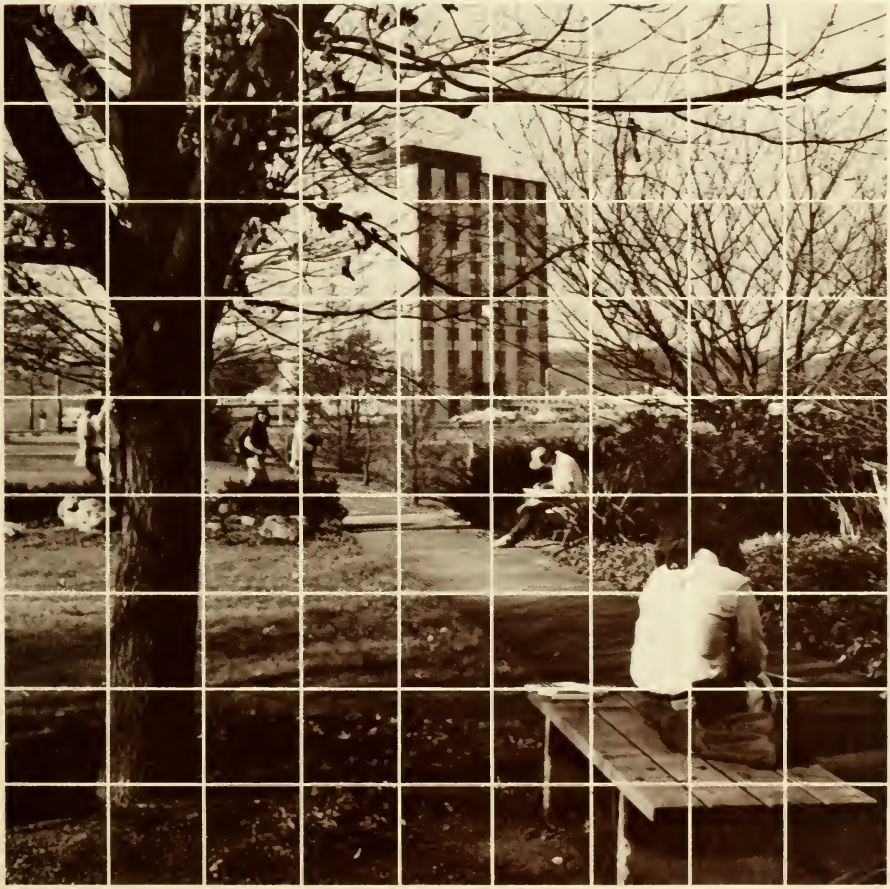
WEST VIRGINIA UNIVERSITY BULLETIN

1983–84

UNDERGRADUATE CATALOG



COVER—Engineering Sciences Building

Evansdale Library

Towers Residence Halls

Mineral and energy resources lab

WEST VIRGINIA UNIVERSITY

1983-84 Undergraduate Catalog

The *1983-84 West Virginia University Undergraduate Catalog* is a general source of information about course offerings, academic programs and requirements, expenses, rules, and policies. The courses, requirements, and regulations contained herein are subject to continuing review and change by the West Virginia Board of Regents, University administrators, and the faculties of schools and colleges to best meet the goals and objectives of the University. The University, therefore, reserves the right to change, delete, supplement or otherwise amend at any time the information, course offerings, requirements, rules, and policies contained herein without prior notice.

Edited by Stanley J. Nels
Associate University Editor

1983

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UNIVERSITY CALENDAR, 1983-84

Summer Sessions, 1983

May 18, Wednesday ..... Registration, First Summer Session
May 18, Wednesday ..... First Classes
May 19, Thursday ..... Malcolm X's Birthday—Day of Special Concern
May 30, Monday ..... Memorial Day Recess
June 30, Thursday ..... Last Classes
June 30, Thursday ..... Registration, Second Summer Session
July 1, Friday ..... First Classes
July 4, Monday ..... Independence Day Recess
August 12, Friday ..... Last Classes

First Semester, 1983-84

August 18, 19, Thursday and Friday ..... New Student Orientation
August 19, Friday ..... General Registration
August 22, Monday ..... First Classes
September 5, Monday ..... Labor Day Recess
September 8-9, Thursday and Friday ..... Rosh Hashanah—Days of Special Concern
September 17, Saturday ..... Yom Kippur—Day of Special Concern
October 7, Friday ..... Mid-Semester
October 7, Friday ..... Mid-Semester Reports Due
November 19, Saturday, to November 27, Sunday, incl. ..... Thanksgiving Recess
December 9, Friday ..... Last Classes
December 12, Monday, to December 17, Saturday, incl. ..... Final Examinations
December 18, Sunday, to January 5, Thursday, incl. ..... Christmas Recess

Second Semester, 1983-84

January 6, Friday ..... General Registration
January 9, Monday ..... First Classes
January 15, Sunday ..... Martin Luther King's Birthday—Day of Special Concern
February 20, Monday ..... Washington's Birthday Recess
February 24, Friday ..... Mid-Semester
February 24, Friday ..... Mid-Semester Reports Due
March 3, Saturday, to March 11, Sunday, incl. ..... Spring Recess
April 10, Tuesday ..... Faculty Assembly
April 20, Friday ..... Good Friday—Day of Special Concern
April 23, Monday ..... Easter Recess
April 27, Friday ..... Last Classes
April 30, Monday, to May 5, Saturday, incl. ..... Final Examinations
May 7, Monday ..... Grade Reports for All Graduates Due in Dean's Office
May 8, Tuesday ..... Dean's Reports for All Graduates Due in Office of Admissions and Records
May 12, Saturday ..... Alumni Day
May 13, Sunday ..... Commencement

The academic year is divided into two semesters of about seventeen weeks each and summer sessions.

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Charleston, WV 25301

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West Virginia University is an Equal Opportunity-Affirmative Action institution. In compliance with Federal Executive Order No. 11246 as amended, Title VII of the Civil Rights Act, West Virginia Human Rights Act, Title IX (Educational Amendments of 1972), Sections 503 and 504 of the Rehabilitation Act of 1973, and other applicable laws and regulations, the University provides equal opportunity to all prospective and current members of the student body, faculty, and staff on the basis of individual qualifications and merit without regard to race, sex, religion, age, national origin, or handicap, as identified and defined by law.

The University neither affiliates knowingly with nor grants recognition to any individual, group, or organizaion having policies that discriminate on the basis of race, color, age, religion, sex, national origin, or handicap, as defined by applicable laws and regulations.

—Office of the President

CORRESPONDENCE

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Vice-President for Academic Affairs and Research

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Dean of Admissions and Records

Housing and Residence Life
Director

Loans, Scholarships, Work-Study
Student Financial Aid Office

Student Life
Dean

Veterans Educational Assistance
Student Financial Aid Office

West Virginia University
Morgantown, WV 26506

WEST VIRGINIA UNIVERSITY

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University Hospital, David J. Fine, M.H.A., Administrator

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Edmund B. Flink, M.D., Ph.D., *Claude Worthington Benedum Professor of Medicine.*
Gabor B. Fodor, Ph.D., *Centennial Professor of Chemistry.*
Ruel E. Foster, Ph.D., *Claude Worthington Benedum Professor of American Literature.*
Frank Gagliano, M.F.A., *Claude Worthington Benedum Professor of Theatre.*
Jay H. Kelley, Ph.D., *Distinguished Professor of Mineral and Energy Resources.*
Thomas P. Meloy, Ph.D., *Claude Worthington Benedum Professor of Chemical Engineering.*
Franklin Parker, Ed.D., *Claude Worthington Benedum Professor of Education.*
Hayne W. Reese, Ph.D., *Centennial Professor of Psychology.*
Martin W. Schein, Sc.D., *Centennial Professor of Biology.*

Part 1
GENERAL INFORMATION

Teacher, student, healer, artist, scientist, grower of food and forest, builder of a better world . . . these are the many faces of West Virginia University. It seeks to reconstruct the past, to understand the present, to glimpse and help create the future.

The 22,000 students that WVU serves each year are from every West Virginia county, 48 other states, and 75 foreign countries. One of the University's proudest traditions is the sending of nineteen Rhodes Scholars to Oxford University in England, which ranks WVU among the nation's top forty institutions. WVU also ranks among the top 7 percent of the nation's colleges and universities in the number of Merit Scholars enrolled.

West Virginia University is one of only 72 land-grant institutions serving the nation. They are called land-grant institutions because the Congressional act establishing them in 1862 gave federally owned land to each state that then sold the land and used the funds to begin a college which offered programs in agriculture and engineering.

Since its founding in 1867, WVU has developed into a comprehensive university, offering 172 degree programs through 16 schools and colleges, and it has become the center of graduate and professional education, research, and extension programs in West Virginia.

It is this intellectual mix that makes WVU an exciting institution with an abundance of options for its 19,000 students on the Morgantown campuses. Contributing to this mix is a variety of off-campus learning experiences, including working in state mental hospitals, with social welfare agencies, and as interns in state government; touring the region with a puppet mobile or performing musical groups; summer overseas programs; biology and geology courses at Lake Erie Biological Station and Wallops Island, Va.; geology classes at the Florida Keys; and a program in Renaissance and eighteenth-century studies at the Folger Shakespeare Library in Washington, D.C.

The campuses in Morgantown contain 104 buildings on 799 acres, valued at $348 million; libraries with 1 million books, 826,437 microforms and microfilms, and 9,425 periodicals; and computer facilities that include five computer sites utilizing four computers: an Amdahl 470 V/7A, two DEC VAX 11/780s, and a DEC PDP 11/44.

Branches include the Charleston Division of the WVU Medical Center; Wheeling Division of the School of Medicine; Potomac State College at Keyser, the state's only residential junior college; and five off-campus graduate centers at Jackson's Mill near Weston, in Parkersburg, Potomac State College, Shepherd College in the Eastern Panhandle, and West Liberty State College in the Northern Panhandle.

West Virginia University is a member of the North Central Association of Colleges and Schools. The University's educational programs are accredited by the North Central Association, as well as appropriate accreditation agencies for professional programs.

WWVU-TV, West Virginia's first public television station, broadcasts courses that may be taken for University credit, as well as a variety of cultural and public affairs programs, which reach half of the state's counties.

West Virginia University operates eight experimental farms in Hardy, Jefferson, Monongalia, Monroe, and Preston counties; six experimental forests in Greenbrier, Monongalia, Preston, Randolph, Raleigh, and Wetzel counties; a geology camp in Greenbrier County; and the State 4-H Camp and a museum of mid-nineteenth century life at Jackson's Mill, the boyhood home of Confederate General Stonewall Jackson that has been entered in the National Register of Historic Places.

Potomac State College's transfer programs, designed to conform to the WVU lower division, provide the freshman and sophomore years in the liberal arts and sciences as well as pre-professional studies in agriculture, business and economics, computer science, dentistry, education, engineering, engineering of mines, forestry, journalism, law, medical technology, medicine, music, nursing, pharmacy, physical education, physical therapy, social work, and veterinary medicine. Occupational programs at Potomac State College which lead to the Associate in Applied Science degree include: general business, accounting, industrial management, small business administration, agriculture, computer programming, engineering technology, horticulture technology, and secretarial studies. Certificate programs are in surveying technology assistant and computer equipment operations.

Government and Organization of WVU

The *West Virginia Board of Regents* is vested by law with the authority for the control and management of the University and all other state institutions of higher education. Serving on the Board are nine members appointed by the Governor, with advice and consent of the Senate, and three ex officio members including a faculty member chosen by the Regents' Advisory Council of Faculty and a student named by the Regents' Advisory Council of Students, both of whom vote, and the State Superintendent of Schools.

The president, appointed by the Board of Regents, is the chief executive officer of the University, as well as its principal academic officer—a role which his position as presiding officer of the University Senate symbolizes.

The *University Senate* is the vehicle for faculty participation in the governance of the University. It is a legislative body with original jurisdiction over all matters of academic interest and educational policy that concern the entire University or affect more than one college or school. The Senate's decisions are subject to review and approval by the president and the Board of Regents. The Senate includes the president of the University as chairperson, vice-presidents, academic deans, five administrative officers appointed by the president, and senators elected by members of the University Faculty Assembly to represent their colleges and other constituencies. Each constituency is entitled to one senator for each twenty constituents who are members of the University Faculty Assembly. The Senate normally meets once each month.

The Senate Executive Committee elects a faculty chairperson each year who represents the faculty at the President's staff meetings. Two faculty members also serve on the Vice-Presidents' Advisory Committee for Promotion and Tenure.

The President meets weekly with his Cabinet, which is comprised of the vice-presidents, the chief financial officer, and the executive officer; and

monthly with the University Senate Executive Committee, the Staff Council, Student Administration, and the President's Policy Advisory Committee, which includes the vice-presidents, the chief financial officer, the executive officer, the director of alumni affairs, the director of communications services, the executive director of the WVU Foundation, Inc., and representatives of faculty, staff, and students.

The *University Faculty Assembly* includes the president as presiding officer, vice-presidents, academic deans, associate deans, professors, associate professors, assistant professors, and instructors holding appointments on a full-time basis. The assembly meets once a year in April.

West Virginia University also has a tradition of strong *Student Administration* that touches all aspects of student life and represents student opinion to the administration and faculty. Student Administration has three main units: the Executive Branch; the 11-member Board of Governors; and the Judicial Board. Students serve on 22 University-wide committees, including University Senate committees, the Committee on Student Discipline (two student members and three faculty members), and the Mountainlair Advisory Council (four students and four faculty members).

For non-teaching employees, there is the *Staff Council*, which consists of twelve members elected by their fellow employees in six occupational groups; and Laborers' International Union Local 814, AFL-CIO, which represents many employees.

Morgantown Area

Greater Morgantown has a population of 45,000; Monongalia County, 75,000. Monongalia County is one of the largest deep-mine, coal-producing counties in the nation. WVU is the largest single employer.

Located on the east bank of the Monongahela River, which flows north to nearby Pittsburgh, Morgantown is situated on rugged terrain of the Appalachian highlands. The altitude of the city varies from 800 to 1,150 feet above sea level, and the surrounding hills rise eastward to Chestnut Ridge to reach an altitude of 2,600 feet just ten miles from the city.

The area's temperate climate is marked by four distinct seasons of about equal length. Morgantown averages 40 inches of precipitation a year. Rainy days are fairly common. Falls are beautiful with the hills turning red, orange, and yellow as the leaves change color.

Morgantown is served by Greyhound Bus Lines and by AeroMech Airlines.

A north-south interstate highway, I-79, is one mile west of Morgantown. U.S. 19 and U.S. 119 pass through Morgantown in the north-south direction. U.S. 48—a four-lane, east-west highway—ties I-79 and I-81 together between Morgantown and the Cumberland-Hagerstown, Maryland, region.

Because of WVU's intellectual resources, the Morgantown area is becoming the major research center in the Appalachian region. Four federal agencies have research facilities in the area—Department of Health and Human Services (Appalachian Laboratory for Occupational Safety and Health), Forest Service (Forestry Sciences Laboratory), Morgantown Energy Technology Center of the U.S. Department of Energy, and Soil Conservation Service (West Virginia headquarters).

Two installations add to the area's variety. They are the Robert F. Kennedy Youth Center, a model federal prison; and an earth tracking station of the Communications Satellite Corporation (COMSAT) at Etam in neighboring Preston County (the station sends and receives world-wide telephone and other communications from satellites in outer space).

Housing and Residence Life

More than half of WVU's 19,000 students on the Morgantown campuses live in private rental housing—3,575, mostly freshman students, in University-owned residence halls and 500 in University apartments valued at $50 million; 3,000 in privately-owned dormitories and fraternity and sorority houses; 2,200 commute from their parents' homes; and 9,700 in apartments, mobile homes, and private rooms.

The University Housing and Residence Life Office, G-18 Towers (phone 304/293-2811), provides information concerning University-owned housing. The Student Life Office in Moore Hall provides information concerning privately-owned, off-campus housing (phone 304/293-5611).

Listings for privately-owned rentals change daily so students should visit the Office of Student Life to see what is available and make their own arrangements with landlords.

Students are advised to obtain housing well in advance of the beginning of the academic year because the housing supply is considered tight in the Morgantown area.

Because of the hilly terrain, parking also is extremely limited on the WVU campuses and in the city.

Academic Common Market

West Virginia provides its residents opportunity, through the Academic Common Market (ACM) and through contract programs, to pursue academic programs not available within the state. Both programs permit West Virginians to enter out-of-state institutions at reduced tuition rates.

Contract programs have been established for study in optometry, podiatry, and veterinary medicine. The ACM provides access to numerous undergraduate and graduate programs. The programs are restricted to West Virginia residents who have been accepted for admission to one of the specific programs at designated out-of-state institutions.

Through reciprocal agreement WVU allows residents of states within the ACM to enroll in specific undergraduate and graduate programs on an in-state tuition basis.

Further information may be obtained through Dr. Robert E. Behling, Assistant Vice-President for Academic Affairs and Research, Stewart Hall, West Virginia University, Morgantown, WV 26506. Application must be made through the higher education authority of the state of residence. For West Virginia residents this is the West Virginia Board of Regents, 950 Kanawha Boulevard, East, Charleston, WV 25301.

Part 2
ADMISSIONS, DEGREE PROGRAMS, FEES AND EXPENSES, AND REGULATIONS AFFECTING DEGREES

Admissions

Students will be considered for admission to West Virginia University on the basis of graduation and submission of transcripts from accredited high schools and ACT test results. High school graduates are required to present the following minimum credits:

English—4 units; required of all students.

Mathematics—2 units of college preparatory mathematics, one of which must be algebra; required of all students. *Additional Mathematics Requirements for Certain Programs:* Students who wish to enter any program requiring Mathematics 3 (College Algebra), or above, for graduation must present a minimum of 2 units of algebra and 1 unit of geometry.

Students who wish to enter engineering or mineral and energy resources programs as freshman students must present a minimum of 2 units of algebra, 1 unit of geometry, and ½ unit of trigonometry (or its equivalent). Students who meet most, but not all, of these mathematics requirements may apply for admission to the Pre-College of Mineral and Energy Resources or General Studies programs in the College of Arts and Sciences to undertake a program of study to prepare them to meet the admissions requirements of the College of Engineering or the College of Mineral and Energy Resources.

Applicants with substantial life experience will be considered on an individual basis.

Special admissions regulations for individual colleges or schools appear in Part 3 of this *Catalog* and in Parts 2 and 4 of the *WVU Graduate Catalog*. For admission to the various graduate programs, see the *WVU Graduate Catalog*.

For complete admission information for the College of Law, contact the College of Law. For information concerning the School of Dentistry, School of Medicine, School of Nursing, and School of Pharmacy, see the *WVU Medical Center Catalog*.

All students are required to take the American College Testing (ACT) Program tests and have the report of scores sent to WVU prior to the admission decision, and no other test may be substituted for it.

Students interested in financial assistance must file a Financial Aid Form (FAF) with College Scholarship Service, Box 2700, Princeton, NJ 08540. Forms are available at high schools, or from the College Scholarship Service or the WVU Student Financial Aid Office. Submit only forms dated for the current academic year.

Nonacademic policies and regulations affecting students are summarized in the *Student Handbook*. Students are urged to obtain a copy of the *Student Handbook* from the Division of Student Affairs, 205 Moore Hall.

(*Your Guide to Financial Aid—West Virginia University* is available at the WVU Student Financial Aid offices in the Mountainlair, Downtown Campus, and in 104 Basic Sciences Building, Medical Center. The guide describes available financial aid, application procedures, and estimated educational expenses for attending WVU.)

West Virginia high school students should obtain applications for admission from their high schools. Out-of-state students may write the WVU Office of Admissions and Records and request an application form. Applicants should prepare their part of the application and then return it to their school. The school then will send the completed application and transcript of the student's high school grades directly to the WVU Office of Admissions and Records.

Students should apply for admission when they have met these requirements —

West Virginia Residents:

1. If, after 6 semesters of secondary school, the student has a grade-point average of 2.5 of a possible 4.0 (C+ or above), and has taken the ACT test, the student should apply as soon as possible after September 15.
2. If, after 7 semesters of secondary school, the student has a grade-point average of 2.0 of a possible 4.0 (C or above), and has taken the ACT test, the student should apply as soon as possible after beginning the 8th semester.
3. If the student has a grade-point average of 2.0 of a possible 4.0 (C average) at graduation, and has taken ACT test, the student should apply immediately after graduation from secondary school.
4. Return the application to the high school. The school will complete the high school evaluation and mail the application, the computer sheet, and a copy of the student's high school transcript to the WVU Office of Admissions and Records. If applying on the basis of the General Educational Development (GED) examination, an official copy of the student's test scores and diploma must be sent to the WVU Office of Admissions and Records.

Out-of-State Residents:

1. If, after 6 semesters of secondary school, the student has a grade-point average of 3.0 of a possible 4.0 (B or above), and has taken the ACT test, the student should apply as soon as possible after September 15.
2. If, after 7 semesters of secondary school, the student has a grade-point average of 2.5 of a possible 4.0 (C+ or above), and has taken the ACT test, the student should apply as soon as possible after the beginning of the 8th semester.
3. If the student has a grade-point average of 2.0 of a possible 4.0 (C average) at graduation, and has taken the ACT test, the student should apply immediately after graduation from secondary school.
4. Return the application to the high school. The school will complete the high school evaluation and mail the application, the computer sheet, and a copy of the student's high school transcript to the WVU Office of Admissions and Records. If applying on the basis of the General Educational Development (GED) examination, an official copy of the student's test scores and diploma must be sent to the WVU Office of Admissions and Records.

Admission to Medical Center Programs

Applicants for admission to any of the schools of the WVU Medical Center should write to the Assistant to the Dean of Admissions and Records, WVU Medical Center, Morgantown, WV 26506, who will furnish official

blanks upon which formal application must be made. (The *WVU Medical Center Catalog* has complete information for all Medical Center programs and is available at the Office of Admissions and Records.)

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

When requesting an application by letter for any of the Medical Center programs, the permanent home address must be given.

A $10.00 application fee is required and must accompany the application.

Any applicant who is refused admission, or who fails to enroll after acceptance, must re-apply in the regular manner if consideration for a subsequent year is desired.

Those applicants accepted for admission to any of the programs of the WVU Medical Center, except the Division of Dental Hygiene and out-of-state applicants to the School of Dentistry, are required to deposit $50.00 before acceptance becomes official. Applicants accepted to the Division of Dental Hygiene deposit $40.00, and out-of-state applicants accepted to the School of Dentistry deposit $100. If the applicant enrolls in the program of the applicant's choice, the deposit is applied to the first-semester tuition.

If an application for admission to the School of Medicine is withdrawn after the applicant has been offered a place and has submitted a deposit, such deposit may be refunded any time before March 30 of the year in which enrollment is anticipated, but will not be refunded after this date. Deposits submitted to all other programs are nonrefundable.

It is required that during the first semester of the first year all WVU Medical Center students must complete certain prescribed immunization and diagnositc procedures.

Admission of Transfer Students

Applicants for transfer from another college or university should submit the following to the Office of Admissions and Records:

1. A complete application for undergraduate admission.
2. An official transcript of all college work attempted to date. An official transcript covering subjects subsequently taken should be sent as soon as possible.
3. Catalog pages describing all subjects which have or will have been completed. The applicant's name should be written on each page and each subject must be indicated by a check mark in the margin. Complete catalogs should not be sent. *(Not necessary from West Virginia institutions.)*
4. Students transferring to WVU with less than 28 hours are required to have the scores of the ACT test submitted to WVU.

The cumulative average of all work attempted before transfer must be at least C.

Credits and grades earned for all baccalaureate-level courses at any baccalaureate degree-granting institution in the West Virginia state system of higher education and up to 72 hours of credits and grades earned for college-parallel courses completed at community colleges or branch colleges in the West Virginia state system shall be transferable toward a bachelor's degree. (See also "Requirements As to Residence," page 31.)

Credits (though not grades) are transferable from institutions outside the West Virginia state system for courses carrying a grade of C or higher. A grade of D on the first of sequence courses may be transferred if the second course grade is C or higher.

Credits from two-year community colleges and junior colleges outside the West Virginia state system are limited to 72 hours of lower-division courses. These colleges must be accredited by the North Central Association of Colleges and Schools or other regional accrediting associations.

The transfer of credits does not exempt the student from satisfying all the requirements for the student's degree program at WVU.

Transfer student admission requirements of the College of Engineering and College of Mineral and Energy Resources are presented in Part 3 of the *Undergraduate Catalog* under "College of Engineering" and "College of Mineral and Energy Resources."

All transcripts must be in the Office of Admissions and Records three weeks in advance of registration.

Evaluation of transcripts for transfer of credit is furnished only after receipt of complete official transcripts and application for admission.

Transfer students generally are admitted only after they complete one full year at another institution. Applicants who have less than one full year of college work elsewhere must submit both their college and high school records. Students who have successfully completed 6 hours or less at another accredited institution will apply as freshmen.

Intrauniversity Transfers

Students transferring from Potomac State College of WVU shall be considered intrauniversity transfers. All records made at Potomac State College are part of the student's WVU record, but no more than 72 hours of credits may be applied toward the baccalaureate degree.

If a change of major is involved, the transferee should consult the college, school, or department to which the student is transferring concerning requirements for the new major.

Admission of Special Students

Persons not desiring to become candidates for a degree may, by special permission, be admitted as special students. Such students are subject in all respects to the usual rules relating to registration and scholarship. Admission to any class is subject to the approval of the instructor in charge.

Students who do not plan to follow a degree program at WVU should submit only a statement of good standing from the last college attended.

Admission of Post-Baccalaureate Students

Students possessing one or more earned degrees from an approved college or university and desiring to enroll for undergraduate credit may be admitted as post-baccalaureate students. Students admitted in this category would not be working toward a graduate degree and credit earned while under this classification would be limited to undergraduate credit. Students admitted as post-baccalaureate, since they are limited to undergraduate credit, would be assessed undergraduate fees. Candidates for admission to this classification who are not graduates of WVU must submit an official transcript from the institution granting their latest degree.

Admission of Foreign Students

This school is authorized under Federal law to enroll nonimmigrant alien students.

Foreign students wishing to enroll in WVU must comply with the academic requirements stated above in addition to other academic and nonacademic requirements as follows.

Early Inquiry and Application—Foreign applicants should forward a letter of inquiry one year before they intend to begin study in the United States. Foreign students admitted are expected on campus at the beginning of July for a six-week period of orientation and intensive study of English. The University receives a large number of applications from international students. For this reason and because of the time required for the student to make visa and financial arrangements, April 1 has been established as a deadline after which applications cannot be processed.

Foreign students should make all arrangements for their financial obligations to WVU and for their entire stay in the United States before leaving their country.

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

English Proficiency—All foreign applicants whose native language is not English must submit Test of English As a Foreign Language (TOEFL) scores. A minimum of 550 is required for admission. TOEFL information and registration forms are available from the Educational Testing Service, Princeton, NJ 08540 USA. Tests are normally given six times each year. It requires one month to score and report individual test results. Registration for the TOEFL examination closes five weeks before the testing date.

Credentials—Complete and original official records of all studies undertaken by an applicant at any institution attended (secondary school, college, university, technical school, professional school, etc.) must be provided at time of application for admission to WVU. Copies of original records are acceptable, provided they are officially stamped.

Such records should include: (1) complete dates of attendance; (2) identification of individual subjects; (3) total number of hours in each class per week; (4) total number of weeks each class meets in session; (5) final grade in each subject, for each year; (6) actual credits earned for each subject; (7) class, division, or rank achieved; (8) identification of the individual; (9) explanation of each institution's grading system; and (10) certification, and date, of degree or awards achieved. If any of this information cannot be supplied, an official explanatory statement from the school should be submitted. *(All documents must be accompanied by certified English translations.)*

All documents should be forwarded directly from the registrar or other authorized official of the school to the WVU Office of Admissions and Records.

If an applicant is currently enrolled in a school, tentative admission may be granted on the basis of an incomplete record which indicates the applicant will unquestionably meet the admission standards of WVU. Final admission, however, cannot be approved until the complete record has been received and evaluated.

Foreign Students Transferring Within the United States—Foreign students applying to transfer from schools within the United States will not be admitted and permitted to register at WVU unless they have complied with all transfer procedures as required by the United States Immigration and Naturalization Service (INS).

The school the student was last authorized to attend must have completed and signed the INS form I-538. This, together with a valid I-20 form received from WVU and the I-94 form, must have been submitted to the INS office having jurisdiction over the school the student was last authorized to attend. If the student is not now attending that school, a letter must be added explaining in detail why.

If the INS approves the transfer, this approval will be stamped on the student's I-94. The student must then immediately notify WVU that the transfer has been approved.

Only when these procedures have been completed will WVU undertake to admit and register the student. No student should move to Morgantown without having received this assurance of admission from WVU.

Admission of Veterans

Veterans may be admitted to WVU with less than the minimum admission requirements necessary for other, nonveteran applicants.

Information regarding educational opportunities made possible at the University through provisions of the Veterans Readjustment Benefits Act of 1966—G.I. Bill (Public Law 358), the Vocational Rehabilitation Program of the Veterans Administration (Public Law 16), and the War Orphan's Educational Assistance Act of 1956 (Public Law 634) may be obtained from a financial aid counselor by personal conference at the Student Financial Aid Office in Mountainlair, or by mail. An amendment to Public Law 634, enacted in 1964, provides benefits to many dependents of 100 percent disabled veterans.

Veterans having at least one continuous year of active military service may receive advanced placement credit for General Physical Education 1 and 2. Proof of such military service must be presented to the Dean of Admissions and Records.

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

Readmission

Undergraduate students who leave the University for at least one complete semester are required to submit an application for readmission to the Dean of Admissions and Records.

Students who have been suspended from the University must have written approval from the dean of the school or college to which they desire to be admitted.

Approval in writing must be secured in advance to elect courses offered elsewhere. A cumulative average of C is required in order to obtain such approval. Credit will be accepted for transfer for courses carrying a grade of C or higher when the conditions indicated above have been met.

Students wishing to change their major upon readmission must have permission from their previous dean and the dean of the college to which they desire to be admitted.

Degree Programs Offered by WVU

College of Agriculture and Forestry

Degree Program	Bachelor	Master	Doctorate/ Professional
Agricultural Biochemistry		M.S.	Ph.D.
Agricultural Economics		M.S.	
Agricultural Education	B.S.Agr.	M.S.	
Agricultural Microbiology		M.S.	Ph.D.
Agriculture		M.Agr.	
Agronomy		M.S.	Ph.D.
Animal Nutrition			Ph.D.
Animal Science		M.S.	
Animal and Veterinary Sciences	B.S., B.S.Agr.		
Entomology		M.S.	
Forest Resources Management	B.S.F.		
Forest Resources Science			Ph.D.
Forestry		M.S.F.	
Horticulture		M.S.	
Landscape Architecture	B.S.L.A.		
Plant Pathology		M.S.	Ph.D.
Plant and Soil Sciences	B.S.Agr.		
Recreation and Parks Management	B.S.R.	M.S.	
Resource Management	B.S., B.S.Agr.		
Wildlife Management		M.S.	
Wildlife Resources	B.S.		
Wood Industries	B.S.F.		

College of Arts and Sciences

Biology	B.A.	M.S.	Ph.D.
Chemistry	B.A., B.S.	M.S.	Ph.D.
Computer Science	B.S.	M.S.	
Economics	B.A.		
English	B.A.	M.A.	Ph.D.
Foreign Languages	B.A.	M.A.	
Geography	B.A.	M.A.	
Geology	B.A., B.S.	M.S.	Ph.D.
History	B.A.	M.A.	Ph.D.
Interdepartmental Studies	B.A.		
Mathematics	B.A.	M.S.	
Philosophy	B.A.		
Physics	B.S.	M.S.	Ph.D.
Political Science	B.A.	M.A.	Ph.D.
Psychology	B.A.	M.A.	Ph.D.
Public Administration		M.P.A.	
Sociology and Anthropology	B.A.	M.A.	
Speech Communication	B.A.	M.A.	
Statistics	B.S.	M.S.	

Degree Program	Bachelor	Master	Doctorate/ Professional

Board of Regents Bachelor of Arts Degree

Board of Regents	B.A.		

(Intended for older students who wish to resume and complete their college studies. Detailed information available from the Coordinator, Board of Regents B.A. Degree Program, Student Services Center, West Virginia University, Morgantown, WV 26506.)

College of Business and Economics

Accounting	B.S.B.Ad.		
Business Administration	B.S.B.Ad.	M.B.A.	
Business Management	B.S.B.Ad.		
Economics	B.S.	M.A.	Ph.D.
Finance	B.S.B.Ad.		
Industrial Relations		M.S.	
Marketing	B.S.B.Ad.		
Professional Accountancy			M.P.A.

College of Creative Arts

Art	B.A.	M.A.	
Music	B.M.	M.M.	D.M.A., Ph.D.
In cooperation with College of Human Resources and Education			Ed.D.
Theatre	B.F.A.	M.A., M.F.A.	
Visual Art	B.F.A.	M.F.A.	

School of Dentistry

Dental Hygiene	B.S.		
Dentistry			D.D.S.
Endodontics		M.S.	
Orthodontics		M.S.	

College of Engineering

Engineering		M.S.E.	Ph.D.
Aerospace Engineering	B.S.A.E.	M.S.A.E.	
Chemical Engineering	B.S.Ch.E.	M.S.Ch.E.	
Civil Engineering	B.S.C.E.	M.S.C.E.	
Electrical Engineering	B.S.E.E.	M.S.E.E.	
Industrial Engineering	B.S.I.E.	M.S.I.E.	
Mechanical Engineering	B.S.M.E.	M.S.M.E.	
Occupational Health and Safety Engineering		M.S.	

Degree Program	Bachelor	Master	Doctorate/ Professional

College of Human Resources and Education

Education			C.A.S., Ed.D.
Community Health Education		M.S.	
Counseling and Guidance		M.A.	
Education Administration		M.A.	
Educational Psychology		M.A.	
Elementary Education	B.S.E.Ed.	M.A.	
Family Resources	B.S.Fam.Res.	M.S.	
Reading		M.A.	
Rehabilitation Counseling		M.S.	
Secondary Education	B.S.S.Ed.	M.A.	
Special Education		M.A.	
Speech Pathology and Audiology	B.S.	M.S.	

Interdisciplinary Programs

Genetics and Developmental Biology		M.S.	Ph.D.
Liberal Studies		M.A.L.S.	
Reproductive Physiology		M.S.	Ph.D.

Perley Isaac Reed School of Journalism

Journalism	B.S.J.	M.S.J.	

College of Law

Law			J.D.

School of Medicine

Anatomy		M.S.	Ph.D.
Biochemistry (Medical)		M.S.	Ph.D.
Medical Technology	B.S.	M.S.	
Medicine			M.D.
Microbiology (Medical)		M.S.	Ph.D.
Pharmacology and Toxicology		M.S.	Ph.D.
Physical Therapy	B.S.		
Physiology (Medical)		M.S.	Ph.D.
Biomedical Sciences			Ph.D.*

*Awarded under the auspices of the degree-granting authority of WVU, but in cooperation with the Basic Sciences Departments of Marshall University School of Medicine.

College of Mineral and Energy Resources

Engineering in cooperation with College of Engineering			Ph.D.
Engineering of Mines	B.S.E.M.	M.S.E.M.	
Mineral and Energy Resources		M.S.	Ph.D.
Mineral Processing Engineering	B.S.		
Petroleum Engineering	B.S.Pet.E.	M.S.Pet.E.	

Degree Program	Bachelor	Master	Doctorate/ Professional
School of Nursing			
Nursing	B.S.N.	M.S.N.	
School of Pharmacy			
Pharmaceutical Sciences		M.S.	Ph.D.
Pharmacy	B.S.Pharm.		
School of Physical Education			
Education in cooperation with Human Resources and Education			C.A.S., Ed.D.
Physical Education	B.S.P.Ed.	M.S.	
Physical Education Interdisciplinary	B.S.P.Ed.		
Safety Studies		M.S.	
School of Social Work			
Social Work	B.S.W.	M.S.W.	

Fees and Expenses

All West Virginia University fees are subject to change without notice.

All fees are due and payable to the Controller on the days of registration. Medical Center students pay their fees at the Controller's Office, Basic Sciences Building. Students must pay fees before registration is accepted. Completion of arrangements with the Controller's Office for payment from officially accepted scholarships, loan funds, grants, or contracts shall be considered sufficient for acceptance of registration. Fees paid after regular registration must be paid to the University Cashier in Mountainlair. Medical Center students pay at the Controller's Office, Basic Sciences Building.

All students are expected to register on days set apart for registration at the beginning of each semester or summer session of the University.

No student will be permitted to register at the University after the twelfth day of a semester or the fourth calendar day of the summer sessions or a single summer session. Days are counted from the first day of registration.

Any student failing to complete registration on regular registration days is subject to the Late Registration Fee of $15.00.

Students registering pay the fees shown in the fees charts, plus special fees and deposits as required.

No degree will be conferred upon any candidate and no transcripts will be issued to any student before payment is made of all tuition, fees, and other indebtedness to any unit of the University.

Persons not registered as University students and who are not members of its administrative or teaching staffs shall not be admitted to regular attendance in University classes.

Semester Fees in Colleges and Schools

(Subject to Change Without Notice.)

FULL-TIME[1]

Undergraduate[a/f]

	Tuition	Registration	Higher Education Resources	Institutional Activity	Mountainlair Construction	TOTAL
Resident	$ 80.00	$ 50.00	$110.00	$140.00[e]	$40.00	$ 420.00
Nonresident	400.00	250.00	350.00	$140.00[e]	40.00	1,180.00

Graduate[b/f]

Resident	$110.00	$ 50.00	$110.00[c]	$140.00[e]	$40.00	$ 450.00
Nonresident	500.00	250.00	350.00[c]	$140.00[e]	40.00	1,280.00

Dentistry and Medicine[f]

Resident	$300.00	$ 50.00	$200.00[d]	$140.00[e]	$40.00	$ 730.00
Nonresident	800.00	250.00	500.00[d]	$140.00[e]	40.00	1,730.00

[a]Undergraduate students enrolled for 12 or more credit hours pay maximum charges as indicated. Students enrolled for less than 12 credit hours pay a pro-rated charge calculated in direct proportion to the number of credit hours taken.

[b]Graduate students enrolled for 9 or more credit hours pay maximum charges as indicated. Students enrolled for less than 9 credit hours pay a pro-rated charge calculated in direct proportion to the number of credit hours taken.

"Graduate," for fee purposes, includes all Graduate Studies Programs and the College of Law.

[c]Paid by Law and Graduate students only.

[d]Dental and Medical students pay appropriate laboratory and microscope fees.

[e]Includes Athletics Fee, $30.00; Student Affairs Fee, $20.00; Daily Athenaeum Fee, $2.50; Health, Counseling, and Program Services Fee, $50.00; Transportation Fee, $35.00; Radio Station Fee, $2.50.

[f]All part-time students enrolled for 7 or more credit hours must pay the Institutional Activity and Mountainlair Construction Fee.

PART-TIME[2]

Tuition per semester hour	*Resident*	*Nonresident*
Undergraduate Students	$20.00	$ 84.00
Graduate Students	30.00	123.00
Dentistry and Medicine Students	62.00	173.00

The minimum rate for noncredit courses is that charged for 1 semester hour of credit.

[1]A full-time graduate student is one who is registered for 9 or more semester hours of work each semester of the regular academic year, or 6 or more semester hours of work altogether during the summer.

A full-time undergraduate student is one who is registered for 12 or more semester hours work each semester of the regular academic year, or 6 or more semester hours of work during a 6-week summer session.

[2]For fee assessment purposes, a part-time graduate student is one who is registered for fewer than 9 semester hours per semester during the regular academic year, or for fewer than 6 semester hours during a 6-week summer session.

A part-time undergraduate student is one who is registered for fewer than 12 semester hours per semester during the regular academic year, or for fewer than 6 semester hours during a 6-week summer session.

ESTIMATED EXPENSES FOR MEDICAL CENTER PROGRAMS (First Semester) [*Subject to Change*]

Tuition and registration are the same for both semesters. Some expenses, such as instruments and books, will be different for the Second Semester.

School or Division	Tuition and Registration Fees		Instruments	Lab Coats, Uniforms, etc.	Books	Total	
	Resident	Nonresident				Resident	Nonresident
Dental Hygiene							
Freshman	$420.00	$1,180.00	$130.00	$17.00	$140.00	$707.00	$1,467.00
Sophomore	420.00	1,180.00	700.00	165.00	155.00	1,440.00	2,200.00
Junior	420.00	1,180.00	100.00	66.00	140.00	726.00	1,486.00
Senior	420.00	1,180.00	50.00	66.00	50.00	586.00	1,346.00
Dentistry							
First Year	730.00	1,730.00	2,200.00	88.00	300.00	3,318.00	4,318.00
Second Year	730.00	1,730.00	600.00	110.00	140.00	1,580.00	2,580.00
Third Year	730.00	1,730.00			75.00	805.00	1,805.00
Fourth Year	730.00	1,730.00				730.00	1,730.00
Medical Technology							
Junior	420.00	1,180.00		85.00	100.00	605.00	1,365.00
Summer	140.00	368.00		160.00	35.00	335.00	563.00
Senior	420.00	1,180.00		137.00	145.00	702.00	1,462.00
Medicine							
First Year	730.00	1,730.00	259.00	103.00	864.00	1,956.00	2,956.00
Second Year	730.00	1,730.00	778.00	103.00	691.00	2,302.00	3,302.00
Third Year	730.00	1,730.00		68.00	691.00	1,489.00	2,489.00
Fourth Year	730.00	1,730.00		68.00	432.00	1,230.00	2,230.00
Nursing							
Sophomore	420.00	1,180.00		126.00	170.00	716.00	1,476.00
Summer	132.00	474.00			55.00	187.00	529.00
Junior	420.00	1,180.00			100.00	520.00	1,280.00
Senior	420.00	1,180.00			100.00	520.00	1,280.00
Pharmacy							
Third Year	420.00	1,180.00	46.00	30.00	200.00	696.00	1,456.00
Fourth Year	420.00	1,180.00		30.00	75.00	525.00	1,285.00
Summer	420.00	1,180.00				420.00	1,180.00
Fifth Year	420.00	1,180.00		30.00	100.00	550.00	1,310.00
Physical Therapy							
Junior	420.00	1,180.00		70.00	431.00	921.00	1,681.00
Senior	420.00	1,180.00		70.00	316.00	806.00	1,566.00
Summer	42.00	177.00				42.00	177.00

TUITION & REGISTRATION FEES BREAKDOWN			Tuition	Registration	Higher Education Resources	Institutional Activity	Mountainiair Construction	Total
Dent. Hyg., Med. Tech., Nsg., Pharm., & Phys. Ther.	Full-time: 9 hr. or more	Resident	$80.00	$50.00	$110.00	$140.00	$40.00	$420.00
		Nonresident	400.00	250.00	350.00	140.00	40.00	1,180.00
Graduate	Full-time: 9 hr. or more	Resident	110.00	50.00	110.00	140.00	40.00	450.00
		Nonresident	500.00	250.00	350.00	140.00	40.00	1,280.00
Dentistry & Medicine	Full-time: 9 hr. or more	Resident	300.00	50.00	200.00	140.00	40.00	730.00
		Nonresident	800.00	250.00	500.00	140.00	40.00	1,730.00

TUITION PER SEMESTER HOUR—PART-TIME & SUMMER (Under 9 hr.)	Resident	Nonresident	
Dental Hygiene, Medical Technology, Nursing, Pharmacy, and Physical Therapy	$20.00 —Per Credit Hour—	$84.00	plus Special Fees
Graduate	30.00 —Per Credit Hour—	123.00	plus Special Fees
Dentistry and Medicine	62.00 —Per Credit Hour—	173.00	plus Special Fees

SEMESTER. $45.00 ◄ SPECIAL FEES ► SUMMER: $17.00 under 6 hr. — $57.00 6 hr and up each session

Special Fees

Application for Undergraduate Admission (Freshman, Transfer, and Foreign Students)	$10.00
Application for Admission (College of Law or Graduate Studies)	20.00
Certificate of Advanced Study in Education	2.00
Diploma Replacement	5.00
Examination for Advanced Standing	35.00
Examination for Entrance Credit, per unit	1.00
Examination of Candidate for Graduate Degree (For graduate students not otherwise enrolled at time of final exam.)	1.00
General Educational Development Tests (high school level) (If the applicant applies for admission to and registers in WVU within twelve months of the date of qualifying for the test, a $10.00 credit shall be established for the applicant.)	15.00
Graduate Program Continuance Fee	35.00
Graduation (Payable by all students at the beginning of the semester or session in which they expect to receive their degrees.)	20.00
Late Registration (nonrefundable) (Not charged to students who complete registration during the regular registration days set forth in the University Calendar.)	15.00
Professional Engineering Degree (includes $20.00 Graduation Fee)	35.00
Reinstatement of Student Dropped from the Rolls	3.00
Student Identification Card Replacement	1.00
Student's Record Fee (One transcript of a student's record is furnished by the Dean of Admissions and Records without charge. This fee is charged for furnishing an additional transcript.)	2.00

Laboratory Fees

Consult specific departmental sections of this *Catalog* concerning nonrefundable deposits and microscope rental fee.

Music Practice and Rental Fees

Practice Room Fee: All music majors must pay a fee of $10.00 per semester, which entitles them to assigned practice space one hour per day. Additional space may be available at the rate of $4.00 per hour.

Band and Orchestra Instruments: Rental, $10.00 per semester.

Service Charge on Returned Checks

A service charge of 5 percent of the amount of each check returned unpaid by the bank upon which it is drawn shall be collected unless the student can obtain an admission of error from the bank.

If the check returned by the bank was in payment of University and registration fees, the Controller's Office shall declare the fees unpaid and registration cancelled if the check has not been redeemed within three days from date of written notice. In such a case the student may be reinstated upon redemption of the check, the payment of the 5 percent service charge, the Reinstatement Fee of $3.00, and the Late Payment Fee of $15.00.

Summer Fees

Tuition, per semester hour	Resident	Nonresident
Undergraduate students	$20.00	$ 84.00
Graduate students	30.00	123.00
Dentistry and Medicine students	62.00	173.00
Daily Athenaeum Fee*	1.00	1.00
Radio Station Fee*	1.00	1.00
Health, Counseling, and Program Services Fee	19.00	19.00
Mountainlair Construction Fee per 6-week summer session or any portion thereof*	15.00	15.00
Student Affairs Fee	8.00	8.00
Transportation Fee	13.00	13.00

*Fee required of all students. (Nonrefundable unless student withdraws officially before the close of general registration.)

Fees for Off-Campus Courses

Fees for credit hours for off-campus students are the same as those charged students enrolled in on-campus courses. Off-campus students do not pay the Daily Athenaeum Fee, the Radio Station Fee, or the Mountainlair Construction Fee. However, all students must pay a $20.00 course fee for each off-campus course taken.

Refund of Fees

A student who officially withdraws from University courses may arrange for a refund of fees by submitting to the University Controller evidence of eligibility for a refund.

To withdraw officially, a student must apply to the Division of Student Affairs for permission. Semester fees will be returned in accordance with the following schedule:

Academic Year (Semester)	*Refund*
During the first and second weeks	90%
During the third and fourth weeks	70%
During the fifth and sixth weeks	50%
Beginning with the seventh week	No Refund

Summer Sessions and Non-Traditional Periods

Refunds for summer sessions and non-traditional periods are established based upon the refund rate for the academic year. (For specific information concerning Summer Session refunds, see the appropriate Summer *Schedule of Courses*.) Should the percentage calculation identify a partial day, the entire day will be included in the higher refund period.

No part of the Activity Fee is refundable unless the student withdraws from the University.

University policy provides that students called to the armed services of the United States may be granted full refund of refundable fees, but no credit, if the call comes before the end of the first three-fourths of the semester, and that full credit of courses be granted to persons called to the armed services of the United States if the call comes thereafter; provided, however that credit as

described above will be granted only in those courses in which the student is maintaining a passing mark at the time of departure for military service. In the recording of final grades, for three-fourths of a semester or more, both passing and failing shall be shown on the student's permanent record.

Cost of an Academic Year's Work

The Student Financial Aid Office estimates that the total cost of attending WVU for a nine-month academic year is $4,350 for single West Virginia residents living on or off-campus and $2,800 for those living at home; $5,400 for single nonresidents living on or off-campus and $3,900 for those living at home.

These typical student budgets include tuition and fees, books and supplies, room, board, transportation, and personal expenses that provide for a modest but adequate life-style.

Identification Card

An identification card is issued to each full-time student upon paying full fees. It entitles the owner admission to certain University athletic events, various activities of student administration, Health Service, and Mountainlair. Confiscation will result from misuse. The University reserves the right to refuse reissuance of an identification card.

Residential Status for Admission and Fee Purposes

The West Virginia Board of Regents has adopted a policy regarding classification of students as residents or nonresidents for admission and fee purposes.

1. *General.* Students enrolling in a West Virginia public institution of higher education shall be classified as resident or nonresident for admission, tuition, and fee purposes by the institutional officer designated by the President. (At West Virginia University, the Dean of Admissions and Records.) The decision shall be based upon information furnished by the student and all other relevant information. The Dean of Admissions and Records is authorized to require such written documents, affidavits, verifications, or other evidence as are deemed necessary to establish the domicile of a student. The burden of establishing residency for admission, tuition, and fee purposes is upon the student.

If there is a question as to residence, the matter must be brought to the attention of the Dean of Admissions and Records at least two weeks prior to the deadline for the payment of tuition and fees. Any student found to have made a false or misleading statement concerning residence shall be subject to institutional disciplinary action and will be charged the nonresident fees for each academic term theretofore attended.

2. *Residence Determined by Domicile.* Domicile within the State means adoption of the State as the fixed permanent home and involves personal residence within the State with no intent on the part of the applicant or, in the case of the dependent student, the applicant's parent(s) to return to another state or country. Residing with relatives (other than parent(s)/legal guardian) does not, in and of itself, cause the student to attain residence in this State for admission or fee payment purposes. West Virginia domicile may be established upon the completion of at least twelve months of continued residence within the State prior to the date of registration, provided that such

twelve months residency is not primarily for the purpose of attendance at any institution of higher education in West Virginia.

Establishment of West Virginia domicile with less than twelve months residence prior to the date of registration must be supported by evidence of positive and unequivocal action. Priority consideration should normally be given to such evidence as the purchase of a West Virginia home, full-time employment within the State, paying West Virginia property tax, filing West Virginia income tax returns, registering of motor vehicles in West Virginia, and marriage to a West Virginia resident. Items of lesser importance which might be considered as support factors include registering to vote in West Virginia and the actual exercise of such right, possessing a valid West Virginia driver's license, transferring or establishing local church membership, involvement in local community activities, and various other acts which may give evidence of intent to remain indefinitely within the State. Proof of a number of these actions shall be considered only as evidence which may be used in determining whether or not a domicile has been established. Factors militating against the establishment of West Virginia residency might include such considerations as the student not being self-supporting, being claimed as a dependent on federal or state income tax returns or the parents' health insurance policy if the parents reside out of state, receiving financial assistance from state student aid programs in other states, and leaving the State when school is not in session.

3. *Dependency Status.* A dependent student is one who is listed as a dependent on the federal or state income tax return of his/her parent(s) or legal guardian or who receives major financial support from that person. Such a student maintains the same residency as that of the parent(s) or legal guardian. In the event the parents are divorced or legally separated, the dependent student takes the residence of the parent with whom he/she lives or to whom he/she has been assigned by court order. However, a dependent student who enrolls and is properly classified as a resident student maintains that classification as long as the enrollment is continuous and that student does not attain independence and establish domicile in another state.

A nonresident student who becomes independent while a student at an institution of higher education in West Virginia does not, by reason of such independence alone, attain residence in this State for admission or fee payment purposes.

4. *Change of Residence.* A student who has been classified as an out-of-state resident and who seeks resident status in West Virginia must assume the burden of providing conclusive evidence that he/she has established domicile in West Virginia with the intention of making the permanent home in this State. The intent to remain indefinitely in West Virginia is evidenced not only by a person's statements but also by that person's actions. In making a determination regarding a request for change in residency status, the Dean of Admissions and Records shall consider those actions referenced in Section 2 above.

5. *Military.* An individual who is on full-time active military service in another state or a foreign country or an employee of the federal government shall be classified as a resident for the purpose of payment of tuition and fees, provided that the person established a domicile in West Virginia prior to entrance into federal service, entered the federal service from West Virginia, and has at no time while in federal service claimed or established a domicile in another state. Sworn statements attesting to these conditions may be required. The spouse and dependent children of such individuals shall also be

classified as residents of the State of West Virginia for tuition and fee purposes.

Persons assigned to full-time active military service in West Virginia and residing in the State shall be classified as in-state residents for tuition and fee purposes. The spouse and dependent children of such individuals shall also be classified as residents of the State of West Virginia for tuition and fee purposes.

6. *Aliens*. An alien who is in the United States on a resident visa or who has filed a petition for naturalization in the naturalization court, and who has established a bona fide domicile in West Virginia as defined in Section 2 may be eligible for resident classification, provided that person is in the State for purposes other than to attempt to qualify for residency status as a student.

7. *Appeal Process*. The decisions of the Dean of Admissions and Records may be appealed to the President of West Virginia University. The President may establish such committees and procedures as are determined to be appropriate for the processing of appeals. The decision of the President of West Virginia University may be appealed in writing with supporting documentation to the West Virginia Board of Regents in accord with such procedures as may be prescribed from time to time by the Board.

Regulations Affecting Degrees

Candidates for degrees are eligible for graduation when they complete the requirements in the college or school in which they are registered which were in effect at the time of their first registration in that college or school, provided they graduate within a period of seven years from the time of their first registration. Students who do not complete the requirements for graduation within seven years from their first registration must meet *all the conditions* of a later *Catalog* — one that will be no more than seven years old by the time they graduate.

If there are major changes in the *Undergraduate Catalog* during the student's course of study, the student does not have to abide by them unless they are promulgated by the Board of Regents, or by local, state, or federal law. However, by choice and with the approval of the adviser and the Dean, a student may meet *all the conditions* of a later *Undergraduate Catalog* than that under which the student first registered in that college or school.

University policy provides that in view of public and professional responsibilities, the faculty of each of the professional schools of WVU has the authority to recommend to the President of WVU the removal of any student from its rolls whenever, by formal decision reduced to writing, the faculty finds that the student is unfit to meet the qualifications and responsibilities of the profession.

All degrees are conferred by the Board of Regents upon recommendation of the faculties of the various colleges and schools. Degrees are granted at the close of the semester or summer session in which the students complete their work. All candidates for degrees at WVU must report to their academic advisers and fill out an "Application for Graduation and Diploma." Application must be made during the first month of the semester or session in which the candidate expects to be graduated.

Baccalaureate Degrees

Credits Required

In addition to the University requirements listed in this *Catalog*, each baccalaureate degree is conditional upon the completion of a specified number of semester hours of credit, as determined by the student's degree program requirements. Therefore, students must familiarize themselves with their school and degree program requirements, as given in Part 3 of this *Catalog*.

English Composition and Rhetoric

Two semesters of English Composition and Rhetoric (English 1 and 2) are required of all candidates for the bachelor's degree in all colleges and schools of the University, unless part or all of the requirement for certain students of superior achievement is waived under regulations prevailing at the time of admission. Such students will be informed of their eligibility by the Coordinator of Writing Programs in English.

University Core Curriculum

To qualify for graduation, all WVU students must satisfy the requirements of the University Core Curriculum. The separate colleges and schools determine the time at which students take Core courses during their total program of study at the University.

The purpose of the Core Curriculum is to encourage the acquisition of a liberal education. A liberal education presupposes the capacity for synthesizing knowledge of the humanities, social sciences, natural sciences, and mathematics. Such a synthesis of both past and contemporary knowledge can make possible the intellectual flexibility needed to develop values, attitudes, tastes, and traits associated with the educated person in the modern world. Three areas within the Core Curriculum are recognized:

Core A (The study of the accumulated knowledge and experience contained in world literature, fine arts, religion, and philosophy)—

Selected courses in Art, English (exclusive of Engl. 1 and 2), Humanities, Languages, Music, Philosophy, Religious Studies, Multidisciplinary Studies, Speech Communication, and Theatre.

Core B (The study of man's interaction with man and with society in the social, historical, political, economic, and similar contexts)—

Selected courses in Economics, Education Foundations, Forestry, Geography, History, Mineral Resources, Political Science, Psychology, Multidisciplinary Studies, Social Science, Sociology and Anthropology, and Technology Education.

Core C (The study of mathematical and natural sciences designed to foster individual acquisition of knowledge and skills necessary for scientific inquiry)—

Selected courses in Agricultural Microbiology, Biology, Chemistry, Computer Science, Entomology, Genetics, Geology, Mathematics, Nutrition, Physical Science, Physics and Astronomy, Physiology, Multidisciplinary Studies, and Statistics.

Twelve credit hours including at least two subjects must be taken in each area. (Two 4-credit courses and one 3-credit course may be substituted in lieu of 12 credit hours.)

The determination as to whether ROTC courses will be counted toward fulfillment of the Core Curriculum or will be counted as free electives is the prerogative of the department chairperson or dean of the appropriate college or school.

[A listing of courses qualifying for Core Curriculum credit is given in each college or school section of the *Undergraduate Catalog*. Colleges and schools offering Core courses include: College of Agriculture and Forestry, page 49; College of Arts and Sciences, pages 96-97; College of Business and Economics, page 221; College of Creative Arts, pages 229-230; College of Human Resources and Education, page 308; College of Mineral and Energy Resources, page 376; and in Multidisciplinary Studies, pages 383-384.]

Transfer of Credits

(See also "Admission of Transfer Students," page 15.)

Branch, Community, and Junior Colleges

Seventy-two hours of credits and grades earned for college-parallel courses completed at community colleges or branch colleges in the West Virginia system of higher education may be applied toward a baccalaureate degree at WVU. Transfer credit for college-parallel courses completed at other community colleges and junior colleges may not exceed 72 hours. Transfer credit from community colleges and junior colleges is normally limited to lower-division courses.

Requirements As to Residence

A student who comes to WVU from another college or university should transfer no later than the beginning of the third year. In no case will a student who matriculates in WVU later than October 1 in any year be permitted to receive a degree at the next commencement.

In special cases, students who desire to leave WVU at the close of their third year to enter another institution for the purpose of taking a combined course leading to two degrees or of preparing for graduate study, upon application beforehand to the Committee on Academic Standards of the college or school in which they are registered, may be permitted to do the work of the fourth year, or a part thereof, at such other institution and to receive the bachelor's degree from WVU upon presentation of the proper credits.

The transfer student whose undergraduate work has been altogether in institutions within the West Virginia state system of higher education must complete either the last 30 hours of work, or a minimum of 36 hours including 16 of the last 32 hours, in residence. Other transfer students must complete either a total of at least 90 hours or the last 30 hours in residence at WVU. The transfer student may be required to earn up to 15 hours in the major field in residence regardless of the number of hours and the nature of the courses transferred.

Work Done Out of Residence

It is WVU policy to discourage the taking of regular residence courses in absentia. In the case of courses begun at WVU and not completed because of illness or for other acceptable reasons, however, permission to complete the work in absentia under the direction of regular WVU instructors may be granted by the Committee on Academic Standards of the college or school concerned; but in such case credit should be given only upon a report of a grade of no less than C on final examination. This regulation does not apply to WVU off-campus courses.

If the final grade of a student in any course is F, the student must take the course again in residence at WVU if the student desires to receive credit for it, unless the dean of the college or school authorizes the exception.

A student currently enrolled in WVU who wishes to obtain credit toward a WVU degree for courses offered at other institutions should obtain advance approval in writing from the adviser, dean, and the Dean of Admissions and Records. Some courses at some institutions are not directly transferable to WVU credit and, thus, the student runs the risk of losing such credit unless prior approval has been obtained. A student wishing to transfer credit from another institution should also be aware of the "Requirements As to Residence" and the specific degree requirements described elsewhere in this *Catalog*. Transfer credit from institutions outside the West Virginia state system will be accepted only for courses carrying a grade of C or higher when conditions indicated above have been met.

A student who has been suspended for academic deficiencies and who takes courses at other institutions during the period of suspension cannot automatically transfer such credit toward a degree at WVU upon readmission to the University. After one semester of satisfactory performance (C average or better on a minimum of 12 credit hours earned during a regular semester or during the summer sessions) the appropriate transfer credit will be entered into the student's record upon certification by the adviser and dean that the above conditions have been met.

Substitution for Required Course

A student who desires to substitute another course for any prescribed in the student's curriculum or required for the degree toward which the student is working must obtain permission for such substitution from the Committee on Academic Standards in the student's college or school.

Advanced Placement Credit

West Virginia University encourages students to work to their full capacity and to advance as rapidly as appropriate in their academic work. A number of opportunities are open to both qualified high school juniors and seniors, as well as to adults returning to school after an interval of work or military experience, to demonstrate competence beyond that normally associated with graduation from high school.

High school students who take college-level subjects offered in their schools in cooperation with the College Entrance Examination Board (CEEB) Advanced Placement Program should take the appropriate three-hour examination administered by the Advanced Placement Service and have the scores sent to WVU. Credit for corresponding WVU courses will be given for high achievement on these tests.

Applicants for admission to the University, especially those who have gained a significant level of maturity through their life experiences, may gain college credit for their educationally related experiences through the College Level Examination Program (CLEP) of the CEEB. Policy of the West Virginia Board of Regents allows University credit to be awarded for successful completion of any of the CLEP Subject Examinations, except English composition, as well as allowing up to 34 hours of general education credit for successful performance on the CLEP General Examinations. Although the program is designed primarily for adults, exceptionally well qualified high school seniors may find it advantageous to seek advanced standing via the CLEP program. Interested applicants may write the Dean of Admissions and Records for further information regarding the CLEP program and WVU credit.

Advanced placement also may be granted for specific military experience. Returning veterans should consult the Dean of Admissions and Records for details.

After admission to WVU, students may elect to take examinations demonstrating their competence in particular course work. Credit or advanced placement is given for satisfactory completion of the tests. Students interested in challenging courses by examination should consult their advisers for procedures and details.

Credit by Examination

Students actively enrolled in WVU may receive credit for courses by demonstrating competency in the content covered by a particular course. The department responsible for administering the course will determine the evaluation tools. Where skill and cognitive abilities are components of the course, both will be evaluated. Credit will be given if a satisfactory degree of competency is demonstrated.

A college, school, or department may require students desiring such credit to prepare a self-evaluation statement determining the degree of competency they possess and the methods by which it was achieved.

Students interested in receiving credit for a course by examination should consult the college or school in which the course is offered for procedures and details.

Credit for Correspondence Work

Credit up to a maximum of 30 semester hours for work completed by correspondence in nonlaboratory courses will be accepted by WVU when such work is given by accredited colleges or universities that accept work for credit toward their own degrees and whose residence work is accepted by WVU.

Second Bachelor's Degree

A student who has received one baccalaureate degree and wishes to receive a second baccalaureate degree must satisfactorily complete enough additional credits so that the total, including all acceptable credits earned at WVU and elsewhere, is at least 30 semester hours more than the number required for the first baccalaureate degree; all requirements, departmental and otherwise, of the second baccalaureate degree program must be satisfied. In no case will a second baccalaureate degree be awarded to a student who has not met the University residence requirement (see "Requirements As to Residence").

A student who wishes to receive simultaneously two baccalaureate degrees must satisfactorily complete a minimum of 158 credits and meet all requirements, departmental and otherwise, of both degree programs. Students desiring to receive simultaneous baccalaureate degrees must be admitted to both programs and provide the Office of Admissions and Records of the college or school approvals in writing.

(Effective Date: Students graduating after August 31, 1979.)

Visitors

Full-time University students may attend classes as visitors, provided they obtain the written permission of their advisers and of the instructors in classes they desire to visit. Members of the administrative or teaching staffs, or other regular employees of the University, may attend classes as visitors provided they obtain written permission of the chairpersons of their departments and of the instructors in the classes which they desire to visit.

No credit is given for work in such classes. Such persons may not obtain credit by advanced standing examinations in courses attended as visitors.

Auditors

Students may enroll in courses without working for grade or for credit by registering as auditors and by paying full fees. Change in status from audit to credit or from credit to audit may be made during the registration period. Attendance requirements for auditors shall be determined by the instructor of the course being audited. It is the prerogative of the instructor to strike the name of any auditor from grade report forms and to instruct the Office of Admissions and Records to withdraw the auditor from the class, if attendance requirements are not met.

Summer Sessions

There are two summer sessions, each of six weeks duration. The first session begins approximately the middle of May and ends June 30. The second session begins July 1, and ends the second week of August. Requirements for admission and character of the work offered are the same for the summer sessions as for the regular academic year.

Credit may be obtained toward the bachelor's, master's, and doctorate. Offerings are varied from summer to summer so that students may complete work for the master's degree by attending summer sessions only.

For complete information, see the *WVU Summer Sessions Schedule of Courses.*

Evening Education

The University offers a program of evening classes for the benefit of those who wish to continue their education beyond the high-school level and who are unable to attend the usual day classes.

All courses are taught by resident faculty members and carry full college residence credit. Many of these courses may be counted toward advanced degrees.

Classification of Students

The following shows the number of semester hours required for classification as second-year, third-year, and fourth-year students:

Freshman classification ..... 1-28 semester hours, inclusive
Sophomore classification ..... 29-58 semester hours, inclusive
Junior classification ..... 59-88 semester hours, inclusive
Senior classification ..... 89-or more semester hours, inclusive

Grade-Point Average

All academic units of the University require minimum standards of scholastic quality. Grade points are computed only on grades earned at WVU and at other institutions in the West Virginia state system of higher education. To be eligible for graduation, a student must have a grade-point average of 2.0 (C) or higher on all work for which the student receives grades (except W, WU, and P). In addition, specific degree programs may require minimum grades of C, or in some cases higher than C, in specific courses or portions of the baccaulaureate program.

It is the student's responsibility to keep informed of the student's grade-point standing. This information may be obtained at any time from the dean of the college or school in which the student is registered.

Seventy-two hours of credits and grades earned for college-parallel courses completed at community colleges or branch colleges in the West Virginia system of higher education may be applied toward a baccalaureate degree at WVU. Transfer credit for college-parallel courses completed at other community colleges and junior colleges is normally limited to lower-division courses.

Graduation with Honors

The University recognizes distinguished academic achievement by awarding initial baccalaureate degrees *Summa Cum Laude, Magna Cum Laude*, or *Cum Laude*, to qualified students. The following regulations govern these awards:

1. Grade-point averages for graduation *Summa Cum Laude, Magna Cum Laude*, or *Cum Laude* shall be computed by starting with the student's penultimate semester or summer session and continuing in reverse chronological order until at least 80 semester hours, excluding credits earned with a grade of P, have been counted. If, in order to total the required number of hours it is necessary to include any part of a semester or summer session, the work of the whole semester or session shall be included.

2. Students who transfer to WVU may be eligible for graduation with honors based on the computational system stated above.

3. Subject to the above conditions, all candidates for a baccalaureate degree whose grade-point average is 3.80, or higher, shall be graduated *Summa Cum Laude*. Those whose average is lower than 3.80, but equal to or higher than 3.60, shall be graduated *Magna Cum Laude*. Those whose average is lower than 3.60, but equal to or higher than 3.40, shall be graduated *Cum Laude*.

4. Fitting recognition of graduation *Summa Cum Laude, Magna Cum Laude*, or *Cum Laude* shall be made on the candidate's diploma and in the Commencement Program.

(This policy became effective for all students whose first enrollment in an institution of higher education was on or after May 15, 1979.)

Examinations and Reports

Courses

As a rule courses extend through one semester only, although some are of a year's duration. No credit will be given for less than an entire course except by special order of the Committee on Academic Standards. Grades given at the end of the first semester in courses extending throughout the year are merely indicative of the quality of work done by the student to that point and do not give credit for the part of the course so far completed. Such first-semester grades may be considered in determining the final grade, however.

Summer sessions courses carry the same credit value as courses offered in the regular semesters.

Evaluation of Student Progress

Measurement and evaluation of learning, consistent with the objectives of the course, provide opportunity for the student and the teacher to evaluate progress through a variety of methods. Evaluation by final examination alone is discouraged.

Students are responsible for all materials presented or assigned in scheduled instructional sections. Failure to complete all assigned work may result in a report of I or a grade of F at the discretion of the instructor.

Final examinations are held during the last week of each semester of the academic year and during the last two days of each summer session. A listing in the *Schedule of Courses* each semester sets the time for final examinations.

The only tests permitted during the week of classes preceding finals will be in evening classes, practical laboratory tests, make-up examinations, and regularly scheduled short quizzes.

Absence from Examinations

The student is required to take all regular examinations. If a student attends a course throughout the semester and is absent from the final examination without permission, the instructor shall count the examination as zero and report the final grade as F. If, in the opinion of the instructor, the absence of the student was for satisfactory reason, a grade of I may be reported.

A student who has been absent because of illness, authorized University activities, or other reasons approved by the student's dean, has the opportunity to make up regularly scheduled examinations.

Grade Reports

In the seventh week of classes of each semester, instructors in all undergraduate courses shall submit a report of students doing unsatisfactory work; that is, earning grades of D or F. These grades are used for counseling and are not recorded on the student's permanent record in the Office of Admissions and Records. These reports are sent to the Dean of Admissions and Records or a representative and this information is transmitted to the student, parent or guardian, adviser, and the dean of the college or school.

Final grades are reported by instructors directly to the Office of Admissions and Records within 48 hours after the closing of the examination. The rule also applies to the final grades of all students registered in other colleges or schools of WVU who are enrolled in law courses.

The final standing of all seniors provisionally approved for graduation at the close of the second semester shall be reported by their instructors to the deans of their colleges and schools, and the final standing of all graduate students provisionally approved for graduation shall be reported to the Associate Vice-President for Graduate Studies and Research. Special report cards are supplied by the Dean of Admissions and Records.

A report of each student's work is made at the close of the semester or summer session to the student or to the student's parents or guardian.

Grading, Absences, Academic Standing, Probation, Suspension, Reentry, Withdrawals

Grading System

A — excellent (given only to students of superior ability and attainment)
B — good (given only to students who are well above average, but not in the highest group)
C — fair (average students)
D — poor but passing
F — failure
I — incomplete
W — withdrawal before the end of the fifth week of a semester or withdrawal doing satisfactory work thereafter
WU — withdrawal doing unsatisfactory work (after the fifth week of a semester)
P — pass (see Pass-Fail Grading below)
X — auditor, no grade and no credit
CR — credit but no grade
PR — progress. Final grade at end of the second semester (Medical Center)
S — Satisfactory
U — Unsatisfactory (equivalent to F) [in certain approved graduate courses]

Pass-Fail Grading

The basic purpose of pass-fail grading for undergraduates at WVU is to promote the undertaking of elective courses unrelated to the student's fields of degree concentration. A secondary purpose of pass-fail grading is to facilitate student grading in performance or competency based courses which may be an integral part of the student's program.

Student Option. Any full-time student who has completed 15 hours and maintains a 2.0 grade-point average may elect to take a maximum of 4 hours each semester or each summer session in which the grade earned will be either P (pass) or F (fail). The courses taken for pass-fail grading must be free electives and shall not exceed a total of 18 hours of credit. Unless otherwise indicated, excluded are courses in the student's major, courses in other subjects that are required by the major, and courses taken to satisfy either University, college, or school requirements. For example, courses elected to satisfy the English, Core, or Foreign Language requirements may not be taken for pass-fail grading.

The student electing the pass-fail grading option will be graded as a regular student and the appropriate letter grade will be submitted to the

Office of Admissions and Records. The Office of Admissions and Records shall convert the earned letter grade to P-F on the basis of A, B, C, or D for a pass, and F for a fail.

The selection of a course for pass-fail grading must be made at registration and may not be changed after the close of the registration period.

College or School Option. A department or unit may designate any performance or competency based course which, with the approval of the college or school and the University Senate, may be offered exclusively as P-F. Such courses offered only as P-F shall not be included in the maximum of 18 hours that may be freely elected under the student option.

(This revised policy became effective as of the beginning of the First Semester, 1977-78, for grading under the Student Option.)

Grade Points

Grade points are based on the following grade-point values for each semester of credit:

A	B	C	D	F	I	U
4	3	2	1	0	0	0

The grade-point average is computed on all work for which the student has registered with the following exceptions:

(a) Courses with W, WU, P, S, and X.

(b) If an undergraduate student earns a grade of D or F in any course at WVU taken no later than the semester or summer session registration when a cumulative total of 58 hours has been attempted, and if this course is repeated in residence at WVU, one time only, the lower grade shall be disregarded for the purpose of determining the student's grade-point average, hours passed and hours attempted, and the higher grade earned for this course shall be used in determining the student's grade-point average, hours passed and hours attempted. The first grade recorded shall not be deleted from the student's record and the second grade will be entered marked repeat, in the semester when taken. The repeat shall be completed no later than the semester or summer session registration when a cumulative total of 70 hours has been attempted. *(Effective Date:* For students enrolled for the first time at West Virginia University for a session after May 15, 1979.) Provided, however, that when a student receives a grade of I and later removes the incomplete grade, the average grade-point standing shall be calculated on the basis of the new grade.

If the final grade of a student in any course is F, the student must take the course again in residence at WVU if the student desires to receive credit for it, unless the dean of the college or school authorizes the exception. The grade of I is given when an instructor believes that the course work is unavoidably incomplete or that a supplementary examination is justifiable. The grade of I must be removed within the following semester or the next semester in which the student is in residence, and becomes a failure unless special permission is granted by the appropriate Committee on Academic Standards to postpone removal.

For teacher certification the student is responsible for every registration in a course for which a grade of A, B, C, D, F, WU, P, or I is received.

Absences

Students who are absent from class for any reason are responsible for work missed.

Students should understand that absences may jeopardize their grades or continuance in the course.

Instructors who use absence records in the determination of grades must announce this fact to students (in writing) within the first five class meetings.

It is the responsibility of the instructor to keep an accurate record of all students enrolled.

Instructors may report excessive absences to the student's dean or adviser.

Students who have been absent because of illness, authorized University activities, or other reasons approved by their deans, have the opportunity to make up regularly scheduled examinations.

Withdrawals

Withdrawal From Classes

Deadlines: Until the Friday of the tenth week of class (or Friday of the fourth week in a six-week summer session, or Friday of the second week of a three-week summer session), students may withdraw from individual courses. Deadlines will be published in the University *Schedule of Courses* each semester.

Procedures:

1. Before withdrawing from individual classes, students are reponsible for consulting their advisers to determine:

(a) Whether their course loads would be reduced below the minimum requirements set by their colleges or schools (if so, permission of the Committee on Academic Standards of the respective college or school is required *before* the course adjustment form may be submitted); *or*

(b) Whether their course loads would be reduced below the minimum number of hours required to qualify for special status, e.g., financial aid, varsity athletic competition, or international full-time student status; *or*

(c) Whether the courses to be dropped are required to fulfill academic probationary conditions; *and/or*

(d) Whether the courses from which they desire to withdraw might be

(1) Corequisite with other courses they are taking; or

(2) Prerequisite to other courses required for the next term.

2. Students must obtain adviser signatures on the University course adjustment forms and then submit the forms to the Office of Admissions and Records.

3. Students who withdraw from courses following all the established University procedures before the published deadline will receive a W on the transcript for the appropriate courses. Grade-point averages are not affected in any way by this mark.

Withdrawal From the University

Deadlines: Students may withdraw from the University *any time before the last day* on which regular classes are scheduled to meet. Students who withdraw from the University before the Friday of the tenth week of classes (or the Friday of the fourth week in a six-week summer session, or the Friday of the second week of a three-week summer session) will receive grades of W in all their courses for that semester or session. Students who withdraw after these deadlines will receive grades of W in those courses in which satisfactory progress had been made; they will receive grades of WU for courses in which progress had been unsatisfactory.

Procedures:

1. Students who decide to leave WVU should withdraw from all classes and must do so in accordance with established University policy. Students are responsible for all *financial obligations* and for following established procedures, including the completion of forms and the delivery of the completed forms to appropriate officials. The withdrawal becomes official only after the forms have been recorded by the Dean of Admissions and Records.

2. Students who are unable to withdraw in person because of illness, accident, or other valid reasons, still must send to the Division of Student Affairs notification of their intention to withdraw. The notice should be verified in writing.

3. Students who desire to withdraw from WVU must obtain a withdrawal form from the Office of Student Life (or dean's office of an off-campus instructional unit). Withdrawal procedure will be explained at that time.

4. With the help of their academic advisers, students are responsible for determining how withdrawal from the University may affect their future status with the University, including such aspects as suspension for failure to make progress toward a degree or violation of established academic probation and eligibility for scholarships, fellowships, or financial aid.

Re-Enrollment After Withdrawal

An undergraduate student who withdraws from WVU in two consecutive semesters (excluding summer sessions) may not register for further work without approval of the dean of the college or school in which the student wishes to register and subject to conditions set by that dean.

Advisers, Committee on Academic Standards

Advisers

Each student entering WVU is assigned an adviser whose duty is to assist students in preparing schedules, assign them to classes, and certify their study lists to the Dean of Admissions and Records. The advisers are expected to give such advice and sympathetic guidance as the students may need in their work at the University. Students are expected to go freely to their advisers to discuss problems.

Advisers, upon receipt of reports of excessive numbers of absences, shall have conferences with the student concerned and shall make such recommendations and adjustments as are desirable and feasible. If the adviser does not find a satisfactory solution after a conference with the student, the case shall be reported to the dean of the college or school.

Committee on Academic Standards

The Committee on Academic Standards of each college or school shall have authority to proceed according to its best judgment in regard to students referred to it for consideration.

All orders of the committee shall become effective when approved by the dean of the college or school.

In exercising its authority the committee shall not suspend a student during a semester except for willful neglect and in cases where the student's class grades are so low that further class attendance would be a waste of time. No suspension shall become effective until approved by the dean of the college or school.

Probation, Suspension, Reentry Policy

Uniform Probation

Any undergraduate student whose cumulative average is 2.0 or higher is in good academic standing in the University. Every baccalaureate degree requires a minimum grade-point average of 2.0 for graduation. (Nothing in this statement prevents a unit from requiring a minimum grade-point average above 2.0, or other academic requirements.)

Students whose cumulative grade-point average is below 2.0 will be notified on semester grade reports that their academic performance is unsatisfactory. Such students may be subject to probation by the dean of their college or school. Students are not on probation until notified, in writing, by their dean, who will establish the terms of their probation.

Uniform Academic Suspension Regulations

The student whose cumulative grade-point deficiency exceeds the "allowable grade-point deficiency" (see Table) is subject to suspension. Normally, students will be suspended only at the end of the academic year; students exceeding the maximum allowable grade-point deficiency at other times may be put on probation or otherwise warned. However, nothing in this provision shall prevent a dean from suspending a student at any other time of the year if the student's grade-point deficiency exceeds the allowable maximum.

Academic suspension identifies the status of a student who has failed to meet the University minimum standards and who has been notified formally by the dean of the college or school of academic suspension. Action on academic suspension is to be taken by the appropriate dean at the end of each semester and such action is to be based on a special report from the Dean of Admissions and Records. The sequence of events in bringing about this action is:

1. The Dean of Admissions and Records will forward a special report at grade-reporting time to the college or school deans for appropriate action.
2. The Dean of Admissions and Records will provide the Vice-President for Academic Affairs and Research with a list of students subject to suspension in each college or school.
3. Deans will report to the Vice-President for Academic Affairs and Research the action taken on the students reported to them for academic suspension by the Dean of Admissions and Records.

Deans have the authority to waive suspension in favor of probation if in their judgment the circumstances of individual cases so warrant. The suspension rule will be set aside only under extraordinary conditions.

Suspension from the University means that a student will not be permitted to register for any classes, including those in summer sessions, offered by the University for academic credit until the student has been officially reinstated. The normal period of suspension is a minimum of one academic semester, but will not exceed one calendar year from the date of suspension.

Students who have been suspended may petition the Committee on Academic Standards of the college or school to which they wish to be readmitted in care of the dean. The normal periods for consideration of petitions are October 1-November 15 and March 1-April 15 of each academic year.

Maximum Allowable Grade-Point Deficiency*

*Total Hours Attempted***	*Maximum Grade-Point Deficiency***	*Total Hours Attempted***	*Maximum Grade-Point Deficiency***
0-19	20	55-59	12
20-24	19	60-64	11
25-29	18	65-69	10
30-34	17	70-74	9
35-39	16	75-79	8
40-44	15	80-84	7
45-49	14	85 or more	6
50-54	13		

*The grade-point deficiency is the difference between the number of grade points needed for a 2.0 average and the number of grade points that a student has actually earned in all courses attempted.

**Includes all hours attempted in institutions in the West Virginia System of Higher Education excluding grades of P, exclusive of the D-F Repeat Policy.

A student who has been suspended for academic deficiencies and who takes courses at other institutions during the period of suspension cannot automatically transfer such credit toward a degree at WVU upon readmission to the University. After one semester of satisfactory performance (C average or better on a minimum of 12 credit hours earned during a regular semester or during the summer sessions) the appropriate transfer credit will be entered into the student's record upon certification by the adviser and dean that the above conditions have been met.

Readmission After Suspension

During the semester immediately following the effective date of suspension, suspended students may petition in writing for readmission. The college or school petitioned shall establish the terms of readmission for successful student petitioners.

After one calendar year from the effective date of suspension any student who has been once suspended shall, upon written application, be readmitted to the University, with the terms of readmission to be established by the college or school entered by the readmitted student.

A suspended student who is readmitted under the provisions above will be placed on academic probation and will be subject to the maximum grade-point deficiency regulations as before, unless the terms of probation agreed to by the student require otherwise. Each college or school will have the right to establish minimum levels of performance expectations.

(*Effective:* August 15, 1980, for all students.)

Cheating

The academic development of students and the overall integrity of the institution are primary responsibilities of WVU. Cheating is condemned at all levels of life, indicating an inability to meet and face issues and creating an atmosphere of mistrust, disrespect, and insecurity. In addition, it is essential in an academic community that grades accurately reflect the attainment of the individual student. Faculty, students, and administrators have shared responsibilities in maintaining the academic integrity essential for the University to accomplish its mission.

Responsibilities

Students should act to prevent opportunities for cheating to occur, and in such a manner to discourage any type of cheating.

Faculty members are expected to remove opportunities for cheating, whether related to test construction, test confidentiality, test administration, or test grading. This same professional care should be exercised with regard to oral and written reports, laboratory assignments, and grade books.

Deans and department chairpersons are expected to acquaint all faculty with expected professional behavior regarding academic integrity, and to continue to remind them of their responsibility. Deans and department chairpersons shall assist faculty members and students in handling first-offense cheating allegations at the lowest possible level in the University, and with discretion to prevent damage to the reputation of any person who has not been found guilty in the prescribed manner.

Each member of the teaching faculty and all other WVU employees, including but not limited to assistants, proctors, office personnel, custodians, and security officers, shall promptly report each known case of cheating to the appropriate supervisor, department chairperson, or dean of the college or school concerned.

Cheating Defined

Cheating is defined to include any of the following:

1. Obtaining help from another student during examinations.
2. Knowingly giving help to another student during examinations.
3. The use of notes, books, or any other source of information during examinations, unless authorized by the examiner.
4. Obtaining without authorization an examination or any part thereof.
5. Plagiarism: submitting for credit, without appropriate acknowledgment, a report, notebook, speech, outline, theme, thesis, dissertation, or other written, visual, or oral material that has been knowingly obtained or copied in whole or in part from another individual's academic composition, compilation, or other product, or commercially-prepared paper.
6. Altering, or causing to be altered, the record of any grade in a grade book, office, or other record.
7. Taking an examination or doing academic work for another student, or providing your own work for another student to copy and submit as his/her own.
8. Presenting false data or intentionally misrepresenting one's records for admission, registration, or withdrawal from the University or from a University course.

Procedure for Handling Cheating Cases

Step 1. At the discretion of the student, faculty member, and chairperson of the department, some cases involving cheating where there is an admission, in writing, of guilt by the student may be satisfactorily resolved at the departmental level. The maximum penalty at Step 1 is an F in the course. Whenever a penalty is administered, the facts of the case shall be reported in writing to the dean of the college or school, and a copy forwarded to the Vice-President for Student Affairs for the Vice-President's permanent records. In cases wherein cheating occurs in a college or school other than that in which the student is a degree candidate, the results of the case shall be reported to the dean of the college or school in which the student involved is enrolled.

Step 2. When the student denies guilt, or the faculty member or department chairperson feels the penalties available at Step 1 are insufficient for a specific act, the dean of the college or school in which the course is offered shall be notified in writing of the specifics of the case. The dean shall then implement the following steps:

a. Formal notification to the student of the charges and the nature of the evidence, which if proved would justify action.

b. Opportunity for the student and witnesses to respond in writing, rebutting the charges.

c. Opportunity for the student to request that the case be forwarded by the dean to the WVU Student Discipline Committee (Step 3).

d. If the student admits guilt in a signed statement to the dean, or is found guilty, the dean shall prescribe the penalty deemed appropriate. Allowable penalties for Step 2 include F in the course, written reprimand, and probation. The dean shall promptly report thereon in writing to the President of the University and shall at the same time place a copy of such report in the permanent record of the student concerned and forward another copy to the Vice-President for Student Affairs for his records. A copy of such report will also be forwarded to the dean of the college or school in which the student is enrolled. The purpose of this copy of the report is to provide information in the event that further discipline or penalty may be deemed warranted by the dean of the college or school in which the student is a degree candidate. These records will be maintained by the deans until the student graduates, at which time the records will be destroyed.

e. The dean shall have the prerogative to refer any first-offense cheating case to the WVU Student Discipline Committee. If the cheating allegation is a second offense, it shall be referred automatically to the WVU Student Discipline Committee (Step 3) for action under its guidelines.

Step 3. The WVU Student Discipline Committee shall handle cases on cheating referred by a dean or requested by a student. The case must be heard using the Committee on Student Discipline guidelines. If the committee finds the student guilty of cheating, it will recommend the penalty it deems appropriate under the circumstances to the President of the University and to the appropriate deans. Allowable sanctions in these cases include, but are not limited to, probation, suspension, or expulsion.

Appeal

The student may appeal to the President of the University any and all decisions of a dean, department chairperson, or Student Discipline Committee, in accordance with standard operating procedures as spelled out in the President's statement on due process of January 29, 1971. Appeals in regard to decisions made by the University's President may be taken to the Board of Regents.

Criminal Act in Connection With Cheating

If a student admits in writing that he/she has been guilty of cheating, or is found guilty of cheating by the Student Discipline Committee, in a case involving what is believed to be a criminal offense—such as theft of an examination or test materials, alteration of records, forgery, breaking or entering buildings, offices, desks, safes, or filing cabinets, damage to property, and other similar misconduct—the academic penalties and discipline as herein prescribed shall be applied. In addition, the facts of the case will be presented to the appropriate prosecuting attorney for further investigation and for such criminal or other action as may be warranted.

Part 3
CURRICULA AND COURSES

Plan for Numbering Courses

For convenience, each course of study is designated by the name of the department in which it is given and by the number of that course. The plan for numbering is as follows:

Courses 1-99—Courses intended primarily for freshmen and sophomores.
Courses 100-199—Courses intended primarily for juniors and seniors
Courses 200-299—Courses for advanced undergraduate students and selected graduate students. No more than 40 percent of the credits counted for meeting requirements for a graduate degree can be at the 200 level.
Courses 300-399—Courses for graduate students; students in professional programs leading to the doctorate; and selected, advanced undergraduates. Undergraduates in any class carrying a 300-level course number should have a 3.0 cumulative grade-point average and have written approval on special forms from their instructors and advisers. Seniors within 12 semester hours of graduation may, with prior approval on special senior petition forms of their advisers, enroll in 300-level graduate courses. (In summary, 200-level courses are intended primarily to serve introductory graduate and master's degree course needs.)
Courses 400 to 499—Courses for graduate students only. All doctor's degree dissertation hours shall be awarded at the 400-level—specifically under course number 497. Courses numbered 497 will be graded S or U.

Graduate degree credit-hour requirements must include at least 60 percent at the 400 and 300 level.

Abbreviations Used in Course Listings

I — a course given in the first semester
II — a course given in the second semester
I, II — a course given in each semester
I and II — a course given throughout the year
Yr. — a course continued through two semesters
S. — a course given in the summer
hr. — credit hours per course
lec. — lecture period
rec. — recitation period
lab. — laboratory period
Conc. — concurrent registration required
PR — prerequisite
Coreq. — corequisite
consent — consent of instructor required
CR — credit, but no grade

Schedule of Courses

Before the opening of each semester and summer sessions, a *Schedule of Courses* is printed announcing the courses that will be offered by the colleges and schools of WVU.

Note

Courses in this *Catalog* are subject to change without notice.

College of Agriculture and Forestry

Dale W. Zinn, Ph.D., *Dean of College of Agriculture and Forestry; Director of Agricultural and Forestry Experiment Station; Professor of Animal Science.*
P. Vernon Armbrester, M.S., *Associate Dean for Academic Programs; Professor of Agricultural Education.*
Alfred L. Barr, Ph.D., *Associate Director, Agricultural and Forestry Experiment Station; Professor of Agricultural Economics.*
Robert H. Maxwell, Ph.D., *Chairperson, Division of International Agriculture and Forestry; Associate Dean; Professor of Agricultural Education.*
Mannon E. Gallegly, Ph.D., *Chairperson of Division of Plant and Soil Sciences; Professor of Plant Pathology.*
Dale K. Colyer, Ph.D., *Chairperson of Division of Resource Management; Professor of Agricultural Economics.*
Jack E. Coster, Ph.D., *Chairperson of Division of Forestry; Professor of Forest Entomology.*
Thomas J. Galvin, D.V.M., Ph.D., *Interim Chairperson of Division of Animal and Veterinary Sciences; Professor of Veterinary Parasitology and Veterinary Parasitologist.*

The College of Agriculture and Forestry is divided into five divisions of study—Animal and Veterinary Sciences, Forestry, Plant and Soil Sciences, Resource Management, and International Agriculture and Forestry. The college's faculty and staff are located in three major buildings on the Evansdale Campus and on four Morgantown area farms and a nearby forest.

Students in the college are offered a variety of fields of study which complement various careers. Emphasis can be placed on studying the biological sciences, animals, plants, trees or soils; or emphasis might be on the social sciences related to resource management or recreation, or on the artistic development of landscapes.

In short, the college and its curricula stress applied ecology, which deals with the relationship of living organisms to their environments. The student of agriculture and forestry studies many different subjects concerned with plants, animals, and microbes that interrelate with and affect our environment. The study of ecology, then, is interwoven throughout the courses offered in the college to give the student a comprehensive understanding of the basic elements at work in our environment.

Such emphasis on ecology is designed to offer students the education necessary for careers emphasizing the protection of environmental quality and the management, utilization, and conservation of our soil, water, forests, wildlife, domestic animals, our food and our fiber.

The college, too, is the site of the state's Agricultural and Forestry Experiment Station, so the University maintains extensive land for research purposes. This land is divided into areas devoted to dairy, livestock, poultry, forestry, wildlife, horticulture, agronomy, and soils. Students and professors use these areas regularly for instruction and research, and information gathered at these holdings is used to update subject matter in the classroom.

Degrees and Curricula

The College of Agriculture and Forestry offers five baccalaureate degrees and eleven curricula in which students may major. The degrees and curricula are:

Bachelor of Science (B.S.)
- Animal and Veterinary Sciences Curriculum
- Resource Management Curriculum
- Wildlife Resources Curriculum

Bachelor of Science in Agriculture (B.S.Agr.)
- Agricultural Education Curriculum
- Animal and Veterinary Sciences Curriculum
- Plant and Soil Sciences Curriculum
- Resource Management Curriculum

Bachelor of Science in Forestry (B.S.F.)
- Forest Resources Management Curriculum
- Wood Industries Curriculum

Bachelor of Science in Landscape Architecture (B.S.L.A.)
- Landscape Architecture Curriculum

Bachelor of Science in Recreation (B.S.R.)
- Recreation and Parks Management Curriculum

Admission

Students may be considered for admission to WVU on the basis of graduation and transcripts from accredited high schools. High school graduates are required to present credit for 4 units of English and 2 units of college preparatory mathematics, of which 1 unit must be algebra. In addition, agriculture and forestry require 1 unit of geometry.

Students who wish to major in areas of animal sciences, plant sciences, or resource management are admitted directly into the College of Agriculture and Forestry.

Students desiring admission to the Landscape Architecture program should check admission requirements with the Associate Dean's office of the College of Agriculture and Forestry or the WVU Office of Admissions and Records.

Students seeking admission to one of the curricula in Forestry must have earned 30 hours of specified college credit. (See Forestry section for entrance requirements.)

(Complete information concerning WVU admissions, registration, fees and expenses, and regulations may be obtained in Part 2 of the *WVU Undergraduate Catalog*.)

Transfer Credits

Students transferring into the College of Agriculture and Forestry from one or two-year technical programs, or from unaccredited programs, must take examinations to demonstrate proficiency for any course offered by the College of Agriculture and Forestry for which transfer credit is sought. In addition, the Division of Forestry applies this rule to dendrology and surveying. All other credits are accepted subject to the regulations of the Office of Admissions and Records.

Credit Load Per Semester

To be considered a full-time student, the minimum work per semester is 12 credit hours and the maximum work per semester is 20 hours. Exceptions to this regulation are:

An adviser may register a student as a part-time student if less than 12 hours are required to meet all requirements for the bachelor's degree.

Any exceptions to these regulations may be requested by petitioning the College's Committee on Academic Standards.

Assigned Topics/Independent Study

A maximum of 12 credit hours of Assigned Topics and/or Independent Study may be counted toward fulfilling the requirements for a bachelor's degree in the College of Agriculture and Forestry.

Honors

The College recognizes outstanding academic achievement by awarding President's and Dean's Lists status to those students obtaining a 4.0 grade-point average or 3.4 grade-point average, respectively. Students must be enrolled full time to be eligible for the President's or Dean's List in any one semester.

Students may obtain Summa Cum Laude, Magna Cum Laude, or Cum Laude recognition upon graduation by earning the overall grade-point average as set forth by University regulations.

Applications for Graduation

All candidates for the bachelor's degree in the College of Agriculture and Forestry must fill out an application for graduation in Room 1006 of the Agricultural Sciences Building at the beginning of the semester in which they expect to receive their degrees.

Grade-Point Deficiencies

Academic Warning

A student with a grade-point average less than 2.0 at the end of a period of enrollment shall be placed on academic warning. Students on academic warning shall be limited to a maximum of 15 credit hours per semester. Students shall be notified in writing of their academic status by the Associate Dean.

Academic Probation

Students who have been reinstated after suspension and students who have transferred from another college with less than a 2.0 grade-point average shall be placed on academic probation until the grade-point deficiency is reduced to a level less than the maximum allowable without suspension. At such time the student will be reassigned to an adviser by the appropriate division chairperson.

While on academic probation a student shall be required to maintain a minimum grade-point average of 2.25 in order not to be suspended.

The Associate Dean's office shall serve as adviser to all students on academic probation.

Academic Suspension and Probation

Students whose grade-point average is below that allowed by WVU at the end of a period of enrollment shall be suspended by the College of Agriculture and Forestry and notified in writing by the Associate Dean.

Students may be reinstated by petitioning the Academic Standards Committee to:

1. Enroll for the summer session to eliminate the grade-point deficiency.
2. Re-enroll according to regulations as set forth by the Academic Standards Committee.
3. After one calendar year a student may enroll in the college, school, or program of his/her choice but under conditions of probation as set forth by the college, school, or program where the student is enrolled.

Students reinstated will be placed on academic probation and may enroll for a maximum of 15 credit-hours and maintain a minimum 2.25 grade-point average for each semester enrolled. The Academic Standards Committee has the option to reduce the hours taken and increase the grade-point average of students on academic probation.

University Core Curriculum Courses

The following courses in the College of Agriculture and Forestry meet the University criteria to qualify for Core Curriculum credit:

Agricultural Microbiology 141, 201—*Core C.*
Entomology 152, 204, 210, 212—*Core C.*
Forestry 140—*Core B.*
Genetics 171, 290—*Core C.*
Multidisciplinary Studies 2—*Core B or C;* MDS 90—*Core A, B, or C.*

Courses and Programs

Mathematics 2 (Algebra) will not be counted toward graduation requirements for any undergraduate degree in the College of Agriculture and Forestry.

General Agriculture

A general agriculture degree is not available in the College; however, students may enroll in a general agriculture program (approximately one year) until such time as a major has been selected.

Agriculture (Agrl.)

11. *Professions in Agriculture.* I. 1 hr. Survey of the subject-matter disciplines available to agriculture graduates. Study of all the dimensions of the industry of agriculture.

12. *Professions in Agriculture.* II. 1 hr. Continuation of Agrl. 11.

200. *Agricultural Travel Course.* S. 1-6 hr. Tour and study of production methods in major livestock and crop regions of the United States and other countries. Influence of population, climate, soil, topography, markets, labor, and other factors on agricultural production.

Agriculture and Forestry (Ag. & F.)

180. *Assigned Topics.* I, II, S. 1-4 hr. Assigned studies of an interdisciplinary nature with a particular specialty area in agriculture and forestry. Students must be in good standing and have prior approval of a proposed outline from the Dean's office.

190. *Professional Development.* I, II, S. 1 hr. per sem. PR: Cooperative education commitment. Evaluation of cooperative education experience in an independent work-study program.

295. *Professional Field Experience.* I, II, S. 1-12 hr. PR: Division approval of planned program. Junior or senior standing recommended. Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competency development. *(Pass/Fail Grading.)*

Agricultural Biochemistry

Interdivisional Program of Agricultural Biochemistry

Thomas J. Galvin, D.V.M. (Tex. A&M U.), Ph.D. (Tulane U.), *Interim Chairperson, Division of Animal and Veterinary Sciences; Professor of Veterinary Parasitology and Veterinary Parasitologist.*

James L. Brooks, Ph.D. (U. Cal.), *Associate Professor of Agricultural Biochemistry and Associate Agricultural Biochemist.*

William H. Hoover, Ph.D. (Penn St. U.), *Professor of Dairy Nutrition.*

L. Morris Ingle, Ph.D. (Purdue U.), *Professor of Horticulture and Plant Biochemistry and Horticulturist.*

Walter J. Kaczmarczyk, Ph.D. (Hahnemann Med. C.), *Professor of Genetics and Agricultural Biochemistry and Associate Geneticist.*

William G. Martin, Ph.D. (WVU), *Program Chairperson; Professor of Agricultural Biochemistry and Agricultural Biochemist.*

Robert L. Reid, Ph.D. (Aberdeen U.), *Professor of Animal Nutrition and Agricultural Biochemistry and Nutritionist.*

John D. Sink, Ph.D. (Penn St. U.), *Professor of Agricultural Biochemistry and Agricultural Biochemist.*

David A. Stelzig, Ph.D. (N.D. St. U.), *Professor of Agricultural Biochemistry and Agricultural Biochemist.*

Valentin Ulrich, Ph.D. (Rutgers U.), *Professor of Genetics and Agricultural Biochemistry and Geneticist.*

Agricultural Biochemistry (Ag. Bi.)

180. *Assigned Topics.* I, II. 1-4 hr. PR: In order to be eligible to register in Assigned Topics, the student must: (1) be in good standing and (2) obtain approval of the Division of Animal and Veterinary Sciences Chairperson before registration.

210. *Introductory Biochemistry.* I, II. 3 hr. PR: Two semesters of general chemistry and one semester of organic chemistry. The biochemistry of the proteins, carbohydrates, lipids, nucleic acids, enzymes, coenzymes, and cellular metabolism in plants and animals.

211. *Introductory Biochemistry Laboratory.* I. 1 hr. Conc.: Ag. Bi. 210. Experiments to demonstrate certain principles and properties of animal and plant biochemicals.

212. *Nutritional Biochemistry.* II. 3 hr. PR: Ag. Bi. 210 or consent. Nutritional biochemistry of domestic animals.

213. *Nutritional Biochemistry Laboratory.* II. 1 hr. PR: Ag. Bi. 210, 211; Conc.: Ag. Bi. 212. Experiments to determine the nutritional constituents in animal and plant tissues.

310. *General Biochemistry.* I. 4 hr. PR: 8 hr. organic chemistry. The first half of a general course of biochemistry designed for graduate students of biological sciences. The course emphasizes the chemical properties of cellular constituents.

311. *Laboratory Experiments in Biochemistry.* I. 2 hr. PR or Conc.: Ag. Bi. 310. Experiments to demonstrate some of the basic tools and procedures of biochemical research.

312. *General Biochemistry.* II. 4 hr. PR: Ag. Bi. 310 or consent. The second half of a general course of biochemistry designed for graduate students of biological sciences. The course emphasizes reactions and control of intermediary metabolism.

314. *Radionuclide Biochemistry*. II. 3 hr. PR: Chem. 1, 2, 131, or consent. Radionuclide methods and isotope handling as needed by students interested in biological research.

Division of Animal and Veterinary Sciences

Faculty

Thomas J. Galvin, D.V.M. (Tex. A&M U.), Ph.D. (Tulane U.), *Interim Chairperson, Division of Animal and Veterinary Sciences; Professor of Veterinary Parasitology and Veterinary Parasitologist.*

Freddie L. Alt, M.S. (WVU), *Morgantown Farms General Manager.*

Gerald C. Anderson, Ph.D. (U. Mo.), *Professor of Animal Science and Animal Husbandman.*

C. Jett Cunningham, Sr., B.S. (VPI), *Professor Emeritus of Animal Science.*

Robert A. Dailey, Ph.D. (U. Wisc.), *Associate Professor of Animal Science and Associate Animal Scientist.*

Leslie Dozsa, D.V.M. (C. Vet. Med., Budapest), *Professor of Veterinary Science and Animal Pathologist.*

Robert S. Dunbar, Jr., Ph.D. (Cornell U.), *Professor of Animal Science and Animal Scientist.*

Edsel Gainer, Ed.D. (N.C. St. U.), *Assistant Professor of Animal Science; Division Leader, Off-Campus Credit Programs.*

Rush C. Hatch, B.S. (WVU), *Reedsville Farm Manager.*

William H. Hoover, Ph.D. (Penn St. U.), *Professor of Dairy Science and Dairy Scientist.*

Donald J. Horvath, Ph.D. (Cornell U.), *Professor of Animal Science and Animal Husbandman.*

E. Keith Inskeep, Ph.D. (U. Wisc.), *Professor of Animal Science and Animal Scientist.*

William T. Jones, M.S. (WVU), *Morgantown Farms Assistant General Manager.*

Ellen R. Jordan, Ph.D. (Ore. St. U.), *Assistant Professor of Dairy Science and State Extension Specialist in Dairy Science.*

Robert O. Kelley, Ph.D. (U. Mo.), *Professor and State Extension Specialist—Dairy Science.*

Harold E. Kidder, Ph.D. (U. Wisc.), *Professor of Animal Science and Animal Husbandman.*

Paul E. Lewis, Ph.D. (WVU), *Associate Professor of Animal Science and Associate Animal Husbandman.*

Marvin R. McClung, Ph.D. (Iowa St. U.), *Professor Emeritus of Animal Science.*

George A. McLaren, Ph.D. (Okla. St. U.), *Professor Emeritus of Agricultural Biochemistry.*

William G. Martin, Ph.D. (WVU), *Professor of Agricultural Biochemistry and Agricultural Biochemist.*

Norman O. Olson, D.V.M. (Wash. St. U.), *Professor Emeritus of Veterinary Science.*

Phillip I. Osborne, Ph.D. (Clemson U.), *Assistant Professor of Animal Science and State Extension Specialist in Animal Science.*

Edward W. Pell, M.S. (WVU), *Assistant Agricultural Scientist and Farm Manager, Willow Bend.*

Ronald A. Peterson, Ph.D. (Mich. St. U.), *Associate Professor of Poultry Science and Associate Poultry Scientist.*

Edward C. Prigge, Ph.D. (U. Maine), *Assistant Professor of Animal Science and Assistant Animal Scientist.*

Robert L. Reid, Ph.D. (Aberdeen U.), *Professor of Animal Science and Nutritionist.*

John D. Sink, Ph.D. (Penn St. U.), *Professor of Animal Sciences and Animal Scientist.*

Paul M. Smith, M.S. (WVU), *Assistant Professor and Dairy Processing Laboratory Manager.*

LeRoy P. Stevens, M.S. (WVU), *Associate Professor of Horticulture and Reymann Memorial Farms Manager.*

Roy O. Thomas, Ph.D. (Mich St. U.), *Associate Professor of Dairy Science and Dairy Scientist.*

A. H. VanLandingham, Ph.D. (WVU), *Professor Emeritus of Agricultural Biochemistry.*

Wayne R. Wagner, Ph.D. (Colo. St. U.), *Assistant Professor of Animal Science and State Extension Specialist in Animal Science.*
James A. Welch, Ph.D. (U. Ill.), *Professor of Animal Science and Animal Husbandman.*
Michael J. Wineland, Ph.D. (U. Wisc.), *Assistant Professor of Animal Science and State Extension Specialist—Poultry Science.*
Frank E. Woodson, D.V.M. (Ohio St. U.), *Professor of Veterinary Science and Veterinarian.*
Dale W. Zinn, Ph.D. (U. Mo.), *Dean of College of Agriculture and Forestry and Professor of Animal Science; Director, Agricultural and Forestry Experiment Station.*

Programs of Study in Animal Science, Dairy Science, Poultry Science, and Food Science

Students taking programs in this division may work towards degrees which enable them to do graduate work, go into commercial agriculture, work for federal or state agencies, the food processing industry, and other areas of food and agriculture. The program in Pre-Veterinary Medicine provides requirements for entry into veterinary colleges. Many pre-veterinary students obtain their bachelor degrees when meeting veterinary school requirements.

Students enrolled in programs in the division take courses in breeding, nutrition, pathology, food science, and animal production. To assist in equipping themselves for the many varied careers in animal agriculture, students take supporting courses in other divisions of the College of Agriculture and Forestry and in other colleges. These include courses such as agricultural biochemistry, mathematics, chemistry, biology, finance, business law, and accounting. The programs are flexible enough to permit the student to obtain a broad background and take enough courses in an area the last two years to prepare for the first job.

Bachelor of Science

ANIMAL AND VETERINARY SCIENCES CURRICULUM

The curriculum in science, with its flexible design, will provide the student with the opportunity to acquire the necessary background in agricultural biochemistry, mathematics, chemistry, physics, and modern concepts of biology in preparation for professional schools of veterinary medicine, human medicine, dentistry, and law, or graduate study in such fields as agricultural biochemistry, animal breeding, animal physiology, and nutrition. Selection of individual courses is the responsibility of the student in consultation with an adviser.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C included)	40
(A minimum of two courses in each of biology, chemistry, physics, and calculus required. The pre-professional student may substitute advanced chemistry courses for calculus to meet degree requirements. This ordinarily means organic chemistry and biochemistry.)	
Courses in the College of Agriculture and Forestry	24
General Physical Education	2
Free electives	32
Total	128

Bachelor of Science in Agriculture

ANIMAL AND VETERINARY SCIENCES CURRICULUM

The curriculum of Bachelor of Science in Agriculture will provide the student with the opportunity to acquire the necessary background in biochemistry, nutrition, breeding, physiology, pathology, agricultural economics, and agronomy to become prepared for a career in animal, dairy, or poultry production and management. There also are food science courses available under the curriculum for those students who are interested in preparing for opportunities in food processing related to dairy, poultry, and meat products.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C included)	24
(Must elect a minimum of 8 credits in biology; 8 credits in chemistry; 3 credits in college algebra or equivalent.)	
Courses in Agriculture	45
Elect a minimum of a 3-credit course, excluding Assigned Topics, in each of the following: 1. Animal Science; 2. Plant Science; 3. Soil Science; 4. Agricultural Economics. (Econ. 54 is a prerequisite for all courses in Agricultural Economics numbered 100 or above.) Elect additional courses to obtain a total of 45 hours in Agriculture.	
General Physical Education	2
Free electives	35
Total	136

Pre-Veterinary Medicine Program

This program is designed to provide students with the academic requirements for entry into professional schools or colleges of veterinary medicine. West Virginia has agreements with Ohio State University and with the Southern Regional Education Board whereby each year up to six students may be accepted by Ohio State University and up to ten may be placed through the Southern Regional Education Board. In order to qualify for these positions the students must have been West Virginia residents for at least the past five years at the time of application. Students may apply to any of the other veterinary schools in the United States and Canada for admission.

Applicants for admission to these colleges of veterinary medicine must present at least 78 semester hours of acceptable credit. Since a maximum of sixteen eligible students are accepted each year, alternate goals in either of the other degree programs are urged for all pre-professional students.

Applicants with a grade-point average of 3.0 or above will be given first consideration for admission to these institutions.

A student who has completed 90 hours of course work at WVU, or 90 hours at institutions within the West Virginia state system of higher education, including at least 36 at WVU, and has completed all required courses for the degree, may transfer credit from a veterinary college to WVU and receive the bachelor's degree.

The *equivalent* of the following pre-professional courses currently meet requirements for contract colleges of veterinary medicine.

Curriculum Requirements	*Hours*
Agricultural Orientation	2
Animal and Poultry Science	6
Animal Nutrition	3
Biochemistry	4
Biology	8
Chemistry (Inorganic)	8
Chemistry (Organic)	8
English	6
Mathematics	6
Microbiology	4
Physics	8
Principles of Heredity	4
Total	69*

*Students are urged to consult their advisers for current requirements of individual veterinary colleges.

Courses of Instruction

Animal and Veterinary Science (A&VS)

51. *Principles of Animal Science.* I. 4 hr. A comparative study of the production of meat, milk, eggs, and wool. Nutrition, physiology, genetics, hygiene and physical environment, and economics are discussed as bases for sound managerial decisions. 1 lab.

180. *Assigned Topics.* I, II, S. 1-4 hr. per sem. In order to be eligible to register in A&VS 180, the student must: (1) be in good standing, and (2) obtain approval of the Division of Animal and Veterinary Sciences Chairperson before registration.

195. *Seminar.* II. 1 hr. Senior seminar.

Animal Nutrition (An. Nu.)

101. *Animal Nutrition.* I, II. 3 hr. PR: Two courses in chemistry. Digestion and metabolism of food nutrients, nutrient requirements of farm animals, and nutritive values of feeds and rations.

294. *Poultry Nutrition.* II. 3 hr. PR: An. Nu. 101. Nutritional requirements, interrelationships, and deficiencies of all types of domesticated fowl.

301. *Principles of Nutrition and Metabolism.* I. 3 hr. PR: Ag. Bi. 210 or consent. A basic course in principles of nutrition with emphasis on the major classes of dietary nutrients and their digestion and utilization.

302. *Nutrition and Physiological Function.* II. 3 hr. PR: An. Nu. 301 or consent. Sequence to An. Nu. 301. Techniques used in nutritional studies and the relationship of nutrient requirements to physiological function in species of laboratory and domestic animals and man.

304. *Nutrition Laboratory Methods.* II. 2 hr. PR: An. Nu. 301 and consent. Diet preparation, food analysis, management of laboratory animals, demonstration of specific nutrient deficiencies, and the conduct and analysis of animal feeding trials designed to examine the nutritional properties of experimental diets.

Animal Physiology and Breeding (An. Ph.)

100. *Introduction to the Physiology of Domestic Animals.* I, II. 3 hr. PR: Biol. 1 or consent. The function and regulation of the principal systems of the animal body.

204. *Animal Physiology Laboratory*. I. 2 hr. PR: An. Ph. 100 or consent. Laboratory study of the physiological systems of animals and the influences of environment on these systems.

225. *Physiology of Reproduction*. II. 3 hr. PR: Course in biology. Comparative physiology of reproduction in higher animals; endocrine functions involved in reproduction; genetic and environmental variations in fertility mechanisms.

226. *Breeding of Farm Animals*. I. 3 hr. PR: Course in genetics or consent. Application of principles of quantitative genetics to the improvement of farm animals.

280. *Behavioral Patterns of Domestic Animals*. II. 3 hr. Examination of the bases for exhibition and control of behavioral patterns of domestic animals. 1 lab.

Animal Production (An. Pr.)

108. *Animal Production Experience*. I, II. 1 hr. A maximum of 4 credit hours may be earned by enrolling in this course. Experience in operating a poultry, dairy, or livestock farm, including trapnesting, incubation, and pedigreeing poultry; feeding, handling, calving, lambing, or farrowing of dairy and beef cows, sheep, and hogs. 3 hr. lab.

137.* *Dairy Cattle History and Selection*. II. 3 hr. To familiarize the student with the history, development, and programs of the breeds of dairy cattle as well as the modern concepts in phenotype and performance record evaluation. 2 labs.

138.* *Grading and Selection of Meat and Meat Animals*. II. 3 hr. Appraisal of live meat animals, carcasses and cuts; evaluation of scientific techniques used in selecting meat animals. Tours of representative flocks and herds will be required. 2 labs.

139.* *Selection, Evaluation, and Grading of Meat Animals*. I. 2 or 4 hr. PR: An. Pr. 138 and consent. Evaluation of breeding merit and potential carcass characteristics of red meat animals. Tours of representative flocks and herds will be required.

141.* *Beef Production*. I. 3 hr. PR: An. Nu. 101. Physiological and economical bases of beef production. 1 lab.

142.* *Pork Production*. I. 3 hr. PR: An. Nu. 101. Physiological and economical bases of pork production. 1 lab.

144.* *Light Horse Science*. II. 3 hr. PR: An. Nu. 101. The application of breeding, nutrition, physiology, and pathology to production and management of light horses. 1 lab.

145.* *Milk Production*. II. 3 hr. Feeding and management of dairy cattle. 1 lab.

146.* *Sheep Production*. II. 3 hr. PR: An. Nu. 101. Physiological and economical bases of sheep production. 1 lab.

240.* *Poultry Production*. I. 3 hr. PR: An. Nu. 101. Special phases of broiler and egg production, disease control, labor-saving studies, and recent designs in housing and equipment for all types of poultry. 1 lab.

250. *Current Literature in Animal Science*. I. 3 hr. PR: An. Nu. 101. Evaluation of current research in animal science and its application to production and management.

*Transportation for required trips in connection with these courses will generally be supplied by the College of Agriculture and Forestry. Students are responsible for their meals and lodging.

Food Science (Fd. Sc.)

107. *Milk and Public Health.* I. 3 hr. Food value of milk and its production and processing in relation to public health. 1 lab. *(Offered in Fall of odd years.)*

112. *Dairy Technology.* II. 3 hr. Introductory. Composition and properties of milk and milk products, butterfat testing, manufacture of dairy products. 1 lab. *(Course will not be offered in 1983-84.)*

130. *Market Milk Products and Frozen Desserts.* I. 4 hr. Assembling, processing, packaging, storing and merchandising dairy products. 1 lab. *(Course will not be offered in 1983-84.)*

134. *Judging Dairy Products.* II. 2 hr. A laboratory course in evaluating and judging dairy products. 2 labs.

166. *Meat Technology.* I. 3 hr. The techniques of red meat, poultry, and game slaughter; holding, cutting, identification, evaluation, and sausage manufacture are studied. Meat plant operations, as well as home slaughter, are explored.

167. *Meat Science.* I. 3 hr. PR: One year chemistry; a biology course. The basic physical, chemical, anatomical characteristics of red meats are studied. Fabrication of meats and meat products and economic evaluation of carcasses are emphasized in the laboratory.

267. *Advanced Meat Science.* II. 3 hr. PR: Fd. Sc. 167. Carcass composition, the transformation of muscle to meat, and properties of meat which affect water binding capacity, pigment formation, meat texture, fiber characteristics, and meat palatability are studied. Marketing trends are also investigated.

Veterinary Science (Vet. S.)

102. *Animal Pathology.* II. 3 hr. Diseases of animals, with special emphasis on the common diseases.

210. *Principles of Laboratory Animal Science.* I. 3 hr. PR: Consent for undergraduates. The management, genetics, physiology, nutrition, disease, and germ-free quartering of common laboratory animals. 1 lab.

305. *Parasitology.* II. 3 hr. PR: Course in biology. Common parasites of farm animals, their control, and their effect upon the host. *(Offered in Spring of odd years.)*

Division of Forestry

Faculty

Jack E. Coster, Ph.D. (Tex. A&M U.), *Chairperson, Division of Forestry; Professor of Forest Entomology.*
James P. Armstrong, Ph.D. (SUNY), *Assistant Professor of Wood Science and Assistant Wood Scientist.*
Eugene C. Bammel, Ph.D. (Syracuse U.), *Associate Professor of Recreation and Leisure Studies and Associate Forest Scientist.*
Lei L. Bammel, Ph.D. (U. Utah), *Associate Professor of Recreation and Leisure Studies and Associate Forest Scientist.*
Franklin E. Boteler, M.F.R. (Penn St. U.), *Assistant Professor of Forest Recreation and Assistant Forest Scientist.*
Samuel M. Brock, Ph.D. (U. Minn.), *Professor of Forest Economics.*
Maurice G. Brooks, M.S. (WVU), *Professor Emeritus of Wildlife Management.*
Kenneth L. Carvell, D.For. (Duke U.), *Professor of Silviculture and Silviculturist.*
Franklin C. Cech, Ph.D. (Tex. A&M U.), *Professor of Genetics and Forest Geneticist.*
Jack I. Cromer, M.W.M. (U. Mich.), *Instructor in Wildlife Management. (Supervisor of Game Research, West Virginia Department of Natural Resources.)*
Donald G. Cuppett, B.S.F. (WVU), *Associate Professor of Wood Science. (Project Leader—Hardwood Utilization, U.S. Forest Service—Princeton Laboratory.)*

Kenny P. Funderburke, Jr., B.S.F. (U. Ga.), *Professor of Forest Management. (Woodlands Manager, Westvaco Corp.)*
Allen W. Goodspeed, M.F. (Yale U.), *Professor Emeritus of Forest Management.*
William N. Grafton, M.S.F. (WVU), *State Extension Specialist—Forestry and Associate Professor.*
Carter S. Hall, M.B.A. (WVU), *State Extension Specialist—Forest Industries and Associate Professor.*
John R. Hamilton, Ph.D. (N.C. St. U.), *Professor of Wood Science and Wood Scientist.*
J. David Helvey, M.S. (U. Ga.), *Instructor in Forest Management. (Research Forester, U.S. Forest Service, Forestry Sciences Laboratory.)*
Ray R. Hicks, Ph.D. (SUNY), *Associate Professor of Forest Management and Associate Forester.*
Beverly Hummel, M.S. (U. Ill.), *Assistant Professor of Recreation.*
Joseph M. Hutchison, Jr., M.S. (WVU), *Professor of Recreation.*
Norman D. Jackson, M.W.T. (N.C. St. U.), *Assistant to Chairperson; Professor of Wood Science and Wood Scientist.*
William E. Kidd, Jr., M.S. (VPI), *State Extension Specialist—Forest Management and Professor.*
Christian B. Koch, Ph.D. (U. Mich.), *Professor of Wood Science and Wood Scientist.*
Edwin D. Michael, Ph.D. (Tex. A&M U.), *Professor of Wildlife Management and Associate Wildlife Biologist.*
David W. Patterson, Ph.D. (Tex. A.&M. U.), *Assistant Professor of Wood Science and Assistant Wood Scientist.*
W. Clement Percival, Ph.D. (SUNY), *Professor Emeritus of Forestry.*
David E. Samuel, Ph.D. (WVU), *Professor of Wildlife Management and Wildlife Biologist.*
William M. Santonas, B.S. (Ohio U.), *Instructor in Wildlife Management. (Supervisor of Resources Planning, West Virginia Department of Natural Resources.)*
Henry C. Smith, M.S.F. (Purdue U.), *Associate Professor of Silviculture. (Project Leader, Silviculture, U.S. Forest Service, Timber and Watershed Management Laboratory.)*
Robert L. Smith, Ph.D. (Cornell U.), *Professor of Wildlife Management and Wildlife Biologist.*
Stanislaw Jan Tajchman, Ph.D. (U. Munich), *Professor of Forestry Meteorology and Forest Scientist.*
Anthony C. Tomkowski, M.S. (WVU), *Assistant Professor of Forestry.*
Earl H. Tryon, Ph.D. (Yale U.), *Professor Emeritus of Silviculture.*
David E. White, Ph.D. (SUNY), *Professor of Forest Policy and Economics and Forest Economist.*
Robert C. Whitmore, Ph.D., (B. Young U.), *Associate Professor of Quantitative Ecology and Associate Forest Scientist.*
Harry V. Wiant, Ph.D. (Yale U.), *Professor of Forestry and Forester.*
William L. Wylie, M.S. (WVU), *Associate Professor of Forest Recreation.*
David O. Yandle, Ph.D. (N.C. St. U.), *Professor of Forest Management and Biometry and Forest Scientist.*
Joseph N. Yeager, M.S. (WVU), *Area Extension Specialist—Forestry and Assistant Professor.*
Gary W. Zinn, Ph.D. (SUNY), *Associate Professor of Forest Management and Associate Forester.*
Peter E. Zurbuch, M.S. (U. Mich.), *Assistant Professor of Wildlife Management. (Assistant Chief, Wildlife Research, West Virginia Department of Natural Resources.)*

Programs of Study

The Division of Forestry offers curriculums in Forest Resources Management, Wood Industries, Recreation and Parks Management, and Wildlife Resources. The first two curriculums lead to the degree of Bachelor of Science in Forestry (B.S.F.); the curriculum in Recreation and Parks Management leads to the degree of Bachelor of Science in Recreation (B.S.R.); the Wildlife Resources curriculum leads to the degree of Bachelor of Science (B.S.)

West Virginia University is one of forty institutions of higher learning in the United States whose forestry programs are accredited by the Society of American Foresters. The society is the accrediting agency recognized by the U.S. Office of Education.

Entrance Requirements

Students who wish to major in one of the curriculums offered by the Division of Forestry must have completed at least 30 hours of college credit with a stipulated grade-point average. The 30 hours may be earned at any institution of higher learning. Specific requirements are listed in each curriculum.

Students enrolling at WVU as freshmen who wish to gain admission to one of the Division of Forestry curriculums will be enrolled as General Forestry students in the College of Agriculture and Forestry to fufill the entrance requirements of the curriculum in which he or she wishes to major. Entrance requirements must be satisfied by the time the student has completed no more than 70 hours of credit at WVU. Otherwise, the student *will not* be admitted to a Division of Forestry major.

Transfer students who wish to major in one of the curriculums offered by the Division of Forestry must also satisfy the specified entrance requirements. Transfer students who have completed the basic 30 hours and have attained the stipulated grade-point average *or* students with 70 or more hours of credit, not including the specified courses, but who have attained the stipulated grade-point average, will be admitted directly to their chosen curriculum.

Transfer students with 70 or more hours of credit but who have not attained the stipulated grade-point average will be permitted to enroll for one probationary semester in the General Forestry curriculum. At the conclusion of the probationary semester, if the stipulated grade-point average has not been attained, another major must be elected in order to remain enrolled at WVU.

Transfer students with less than 70 hours of credit who have not completed the specified courses and/or have not attained the stipulated grade-point average will be enrolled in the General Forestry curriculum until the basic requirements of the curriculum in which he or she plans to major have been fulfilled. However, the 70 credit-hour maximum rule applies (see paragraph 2, above).

General Forestry students *will not* be allowed to enroll in any Division of Forestry course which bears the prerequisite *forestry major or consent.*

To determine the grade-point average to qualify for admission to a Division of Forestry major, the course grades for college work attempted at *all* schools attended will be used.

Transfer Credits for Professional Courses

Students transferring to the Division of Forestry from one- or two-year technical schools or from four-year unaccredited forestry schools must take an advanced standing examination to demonstrate proficiency for any professional course offered by the Division of Forestry for which transfer credit is sought. This rule also applies to courses in dendrology and surveying. Advanced standing examinations are given after the student is enrolled in the Division of Forestry. All other credits are accepted subject to the regulations of the Office of Admissions and Records regarding transfer of credits.

Bachelor of Science in Forestry

FOREST RESOURCES MANAGEMENT CURRICULUM

Students who major in Forest Resources Management take a course of study of 138 credit hours. Students may use elective hours to develop additional professional competence in specialized areas; advisers will provide lists of recommended elective courses suitable for developing specialization.

With the growing demand for forest products and the increasing public consciousness of the value of wildlands for recreation, watershed protection, and aesthetics, career opportunities for professionals are expanding. Graduates in this field have a wide range of potential employment opportunities, including federal and state agencies, and private industry.

Students who wish to major in Forest Resources Management must have earned at least 30 semester hours of college credit with a grade-point average of 2.0 (C) or higher (4.0 possible). The 30 hours must include the following basic courses: 6 hours of English Composition (Engl. 1 and 2); 8 hours of Inorganic Chemistry (Chem. 11 and 12 or equiv.); 8 hours of General Biology (Biol. 1 and 2); 6 hours of Mathematics—College Algebra and Trigonometry (Math. 3 and 4). (*Note:* Math. 2, Algebra, will not be counted toward graduation requirements. Math. 14, Pre-Calculus, will satisfy basic mathematics requirements.)

The basic courses and grade-point average specified above *must* be earned by the time the student has completed 70 hours of college credit; if not, the student cannot be admitted to the Forest Resources Managment major.

Curriculum Requirements	*Hours*
Entrance	30
Agronomy 10—Forest Soils	3
Biology 51 and 52—Dendrology—Angiosperms, Gymnosperms	4
Civil Engineering 5—Land Surveying	4
Economics 54 and 55—Principles of Economics	6
English 105 or 108—Business English or Advanced Comp.	3
Entomology 152 or Plant Pathology 153	3
Forestry 1,* 220, and 226	6
Forest Management 12, 122, 151, 200, 201, 211, 230, 233	27
Forest Hydrology 244	3
Mathematics 15—Calculus	4
Oral Communication	3
Recreation and Parks elective	3
Statistics 101—Elementary Statistical Inference	3
Wildlife Management 131	3
Wood Science 121 and 132	6
Core A, not elsewhere covered	6
Core B, not elsewhere covered	6
Electives	15
Total	138

*Students in the general curriculum should take Forestry 1 during the freshman year.

Bachelor of Science in Forestry

WOOD INDUSTRIES CURRICULUM

Wood Industries majors take a course of study of 138 credit hours with emphasis in management, production, or science. Graduates in the

management and production option are sought by a variety of wood product manufacturers. Job opportunities are available in procurement, management, production, quality control, marketing and research and development with both primary and secondary wood product industries. The science option prepares the student for graduate study in wood science.

Students who wish to major in Wood Industries must have earned at least 30 hours of college credit with a grade-point average of 2.0 or better. The 30 hours must include 6 hours of English (English 1 and 2); 8 hours of chemistry (Chem. 11 and 12 or equiv.); 4 hours of biology; and 6 hours of mathematics through college algebra and trigonometry. (*Note:* Math. 2, Algebra, will not be counted toward graduation requirements. Math. 14, Pre-Calculus, will satisfy basic mathematics requirements.)

Curriculum Requirements	*Hours*
Entrance	30
Biology 51, 52—Dendrology—Angiosperms, Gymnosperms	4
Civil Engineering 1—Surveying	2
Statistics 101 or Economics 125	3
Computer Science 1 or 5	4
Economics 54, 55—Principles of Economics	6
Mathematics 15—Calculus	4
Physics 1—Introductory Physics	4
Forest Management 12, 122, 211, 233 or 234	14-15
Wood Science 123, 132, 134, 141, 200, 201, 240	20
Core electives	18
Restricted electives	28-29
Total	138

Restricted Electives and Areas of Emphasis

Part of the 28-29 hours of restricted electives can be selected by the student with the adviser's consent, according to the student's interest. However, the student must select one of the following three areas of emphasis and take all those courses listed under that area:

Management—

Requirements	*Hours*
Accounting 51, 52—Principles of Accounting	6
Management 105—Management Process	3
Marketing 111—Marketing	3
Finance 111—Business Finance	3
Wood Science 234	3

Production—

Requirements	*Hours*
Industrial Engineering 140, 277	6
Wood Science 231, 232, 234, 251	12

Science—

Requirements	*Hours*
Chemistry 133, 135—Organic Chemistry and Laboratory	4
Mathematics 16—Calculus	4
Physics 2—Introductory Physics	4
Mechanical and Aerospace Engineering 41, 43—Statics and Mechanics of Materials	6

Bachelor of Science in Recreation

RECREATION AND PARKS MANAGEMENT CURRICULUM

The Recreation and Parks Management curriculum consists of 134 hours and is designed to prepare students for a wide variety of professional recreation and parks responsibilities in local, state, and federal agencies; commercial recreation enterprises; private and voluntary agencies; land managing agencies; and those serving special populations. The program options provide each student with a measure of specialization in either administration and planning, interpretation, program leadership, therapeutic recreation, or wildlands management. Discrete use of free electives permits further specialization. An information booklet describing the various options is available from the Recreation and Parks Management Office, 329 Percival Hall, and should be consulted before scheduling courses.

Completion of 30 hours of college credit with a cumulative grade-point average of 2.25 is necessary to gain admittance to the program. The 30 hours must include 6 hours of English composition; 8 hours of natural science; 6 hours of mathematics (college algebra, trigonometry, calculus, finite math, statistics, or computer science); and 3 hours each of economics, psychology, and sociology and anthropology. Selection of specific courses should be made in relation to the program option. (*Note:* Credit for Math. 2, Algebra, will not count as credit earned for degree requirements.)

Students may enroll in Rc. & Pk. 43, Leisure and Human Behavior, and Rc. & Pk. 44, Introduction to Recreation and Park Services, concurrent with semesters during which the 30-hour entrance requirement is being met.

All majors, at the end of the junior year, must complete an approved, full-time internship of not less than 8 weeks with a recreation agency. This may be undertaken at any time during the year.

Curriculum Requirements	*Hours*
Entrance	30
Recreation and Parks 43, 44, 202, 272, 251/263, 233/235/271	19
Recreation and Parks electives	6
Restricted and Core electives	64
Free electives	15
Total	134

Options or Areas of Emphasis

The program of study provides for five areas of emphasis (options): administration and planning, interpretation, program leadership, therapeutic recreation, and wildland recreation management. Each option is developed from a core of recreation classes which establishes a basic professional proficiency in one of the five options. Additional competencies may be developed through the careful selection of electives.

Administration and Planning—The goal of this option is to qualify people for positions of increasing responsibility as administrators, managers, and planners of parks, recreation centers, or systems. In order to manage resources and people, the recreation professional needs a broad background in the physical and social sciences as well as the arts. In addition to recreation classes, students take courses in the arts, economics, forestry, geography, political science, physical education, psychology, and sociology and anthropology. Professional competence is grounded in attaining an understanding of the role and function of recreation in contemporary society and is deepened by experiences both within and outside the curriculum.

Interpretation—The Interpretation Option is concerned with environmental, cultural, and historical information that assists people to understand more clearly their relationship to a changing world, and to communicate that understanding to others. Restricted electives introduce the student to the particular skills necessary for the preparation and presentation of interpretive materials. Course work is taken in biology, communications, forestry, geology, history, and wildlife management. The principal employers are the federal land-managing agencies, state and local recreation and parks departments, school systems, museums, and private recreational enterprises.

Program Leadership—The Program Leadership Option focuses on the planning, leading, and supervising of recreation programs for a variety of clienteles: community and commercial recreation agencies, youth serving organizations, and recreation centers. Restricted electives develop the student's understanding of people and their leisure-time pursuits. These courses are selected from art, music, physical education, psychology, and sociology and anthropology. Students have an opportunity to observe and be involved in local recreation programs.

Therapeutic Recreation—The Therapeutic Recreation Option is an extension of Program Leadership. Learning to plan and provide services for a variety of special populations is the focus of this specialty. Students prepare to work with the physically and/or mentally handicapped, law offenders, and the elderly. Principal employers are community agencies, rehabilitation centers, hospitals, correctional facilities, nursing homes, schools, and camps. Community agencies and the WVU Medical Center provide settings for observation and practical experiences.

Wildland Recreation Management—This option prepares individuals for positions concerned with outdoor recreation in forested settings. In addition to recreation classes, students complete course work in natural resources (forestry, wildlife, environmental), behavioral sciences, political science, economics, and management. Although primary attention is placed upon recreation in wildland settings, there is sufficient flexibility to permit students to emphasize applied outdoor recreation management, general environmental studies, or preparation for graduate school in resource-related fields.

Bachelor of Science

WILDLIFE RESOURCES CURRICULUM

Wildlife Resources majors take a program of study of 136 hours in preparation for professional positions as game and fish biologists, wildlife managers, planners of wildlife conservation programs, or specialists in communicating with the public agency, and in a wide range of positions because of the breadth of the graduate's background in ecology.

Thirty hours of college credit with a grade-point average of 2.25 or better is required for admission to the program. The 30 hours must include 6 hours of English; 8 hours of chemistry (Chem. 15 or 16 or equiv.); 8 hours of biology; and 6 hours of mathematics through college algebra and trigonometry. (Math. 14, Pre-Calculus Mathematics, fulfills the mathematics requirements.) (*Note:* Credit for Math. 2, Algebra, will not count as credit earned for degree requirements. Math. 14, Pre-Calculus, will satisfy basic mathematics requirements.)

The basic courses and grade-point average specified above *must* be earned by the time the student has completed 70 hours of college credit; if not, the student cannot be admitted to the Wildlife Resources major.

Curriculum Requirements	*Hours*
Entrance	30
Chemistry 131—Organic Chemistry	4
Mathematics 128—Introduction to Calculus	4
Economics 54—Principles of Economics	3
Computer Science 1—Introduction to Computer Science	3
Agronomy 2 *or* 10	3
Oral Communication	3
Statistics 101—Elementary Statistical Inference	3
Genetics 171—Principles of Genetics	4
Political Science	3
Animal Physiology 100—Intro. to Phys. of Domestic Animals	3
Wildlife Management 213, 224, 228, 231,* 234*	16
Core electives	15
Restricted electives	29
Free electives	13
Total	136

*Students interested in fisheries will take limnology, ichthyology, or other approved courses in aquatic ecology, in lieu of W. Man. 231 and 234.

Restricted Electives and Areas of Emphasis

The wildlife resources program provides for five areas of emphasized study: wildlife science, wildlife management, fisheries science, communications, and planning. The student, consulting with the adviser in selection of courses, will use the restricted elective hours so as to provide appropriate background in the area chosen for emphasis.

Summer Field Studies

The 6-hour Forest Resources Management Summer Field Practice (F. Man. 200 and 201) consists of two consecutive summer sessions, and is designed for students who have completed the junior year of the Forest Resources Management curriculum. Students live in Morgantown in University or privately owned housing, and travel to the University Forest daily for field studies. The first session provides training in forest surveying, timber estimating, photo interpretation, forest management, and forest recreation. Occasional trips are made to wood-using industries and to other forests to study the management of northern hardwood and spruce types. The second session is a one-week trip to North Carolina where silvicultural and management activities are observed in the Southern Pine Region.

The instructional program in the 4-hour Wood Industry Field Practice (Wd. Sc. 200 and Wd. Sc. 201) consists of a three-week field course in surveying and mensuration followed by a one-week trip to Virginia and North Carolina to observe various commercial wood-using industries. These industries include: lumber, plywood, veneer, particle board, furniture, glue lamination, and preservation.

A Recreation Internship (Rc. & Pk. 202) is required of students who have completed the sophomore year of the Recreation Resources Management curriculum. Eight weeks of full-time supervised professional field work is required of students who have completed the junior year of the recreation curriculum. The summer experiences acquaint students with management of park and recreation enterprises.

Courses of Instruction

Forestry (For.)

1. *Professional Orientation.* I. 1 hr. *(Required only for students who rank as freshmen in forestry.)* Survey of degree options in the Division of Forestry and related career and professional opportunities.

140. *West Virginia's Natural Resources.* I, II. 3 hr. Survey of policies and practices in development and use of soil, water, forest, wildlife, mineral, and human resources in West Virginia.

170. *Problems in Forestry, Wood Science, Wildlife, or Recreation.* I, II, S. 1-4 hr. PR: Forestry senior or consent.

220. *Forest Policy and Administration.* I and II. 3 hr. PR: Upperclass forestry major or consent. Forest policy in the United States; important federal and state laws; administration of public and private forests; problems in multiple-use forestry.

226. *Remote Sensing of Environment.* II. 2 hr. PR: Math. 3, 4. Measurement and interpretation of natural resources and environment from photography, radar, infrared, and microwave imagery.

233. *Principles of Industrial Forestry.* I. 3 hr. PR: Forestry senior or consent. Analysis and case studies of problems pertinent to the integration of wood conversion technology with principles of production, marketing, and management.

Forest Hydrology (F. Hyd.)

41. *Environmental Influences in Forestry.* I. 3 hr. PR: Phys. 1, 2. An introduction to the influences of forests and forestry practices on physical processes that affect the environment.

142. *Forest Climatology.* I. 3 hr. PR: F. Hyd. 41, Phys. 117. The principles, instrumentation, measurement techniques, and applications of forest or terrain climatology in a broad range of forestry endeavors.

243. *Forest Water Quality.* I. 3 hr. PR: Forestry major or consent. Influences of natural forest cover, forest land uses, and harvesting practices on selected water quality parameters that can be detected in simple field and laboratory tests.

244. *Watershed Management.* I, II. 3 hr. PR: F. Man. 12, 211. *(Primarily for forest management majors.)* Influences of silvicultural practices and forest management activities on the hydrology of forested catchments.

Forest Management (F. Man.)

12. *Forest Ecology.* I, II. 3 hr. PR: Biol. 51. Forest and environment factors; site and type characteristics.

122. *Forest Mensuration.* II. 4 hr. PR: Math. 15, Stat. 101. Estimating volume and growth of trees and forest stands with emphasis on the mathematical and statistical techniques involved. Laboratories include practical field experience.

132. *Farm Woods Management.* II. 3 hr. Students majoring in forest resource management and wood industry may not take this course for credit. Characteristics of forest trees; management of farm woods for timber, wildlife, watershed protection, and recreation; measuring and marketing farm timber; plantation establishment.

151. *Forest Fire Protection.* I. 2 hr. Prevention, detection, and control of wildfires. Forest fuels, fire weather, and wildfire behavior. Use of fire for forest management purposes.

200. *Forest Measurement, Interpretation, Wildlife Management.* S. 5 hr. PR: Biol. 51; C.E. 5; F. Man. 122. Application and study of forest resources practice with emphasis on field problems. *(Course will be taught during four consecutive 6-day weeks.)*

201. *Forest Resources Management Southern Trip.* S. 1 hr. PR: F. Man. 200 or consent. One-week trip to the Southern Pine Region to observe forest management practices on private and public lands.

211. *Silvicultural Systems.* I. 4 hr. PR: Forestry major or consent; F. Man. 12. Principles of regeneration cuttings, intermediate cuttings, and cultural operations, with their application of forest stands.

213. *Regional Silviculture.* I. 2 hr. PR: Forestry major or consent. F. Man. 12; PR or Conc.: F. Man. 211. Major forest types of the United States: their composition, management, problems, and silvicultural treatment.

215. *Principles of Artificial Forestation.* II. 3 hr. PR: Forestry major or consent; F. Man. 12. Seeding and planting nursery practice; phases of artificial regeneration.

216. *Forest Genetics and Tree Improvement.* II. 3 hr. PR: Forestry major or consent; Gen. 272, or equiv., or consent. Forest genetic principles and their application to forest tree improvement, including crossing methods, selection systems, and other techniques.

222. *Advanced Forest Mensuration.* II. 3 hr. PR: Forestry major or consent; F. Man. 122. Measurement of growth and yield; statistical methods applied to forest measurement problems.

230. *Principles of Forestry Economics.* I, II. 3 hr. PR: Forestry major or consent; Econ. 51 and 52 or equiv. Production, distribution, and use of forest goods and services. Emphasis on analytical methods and techniques dealing with forest economic problems.

232. *Forest Finance.* II. 2 hr. PR: Forestry junior standing or consent. Interest, discount, and rate earned, in forest production and exploitation. Particular reference to determining value of standing timber, appraisal of forest damages, and forest taxation.

233. *Forest Management.* I. 4 hr. PR: Summer Camp; PR or Conc.: Forestry major or consent; F. Man. 211. Principles of sustained yield forest management. Organization of forest areas, selection of management objectives, application of silvicultural systems, and regulation of cut. Forest management plan.

234. *Integrated Forest Resources Management.* I, II. 3 hr. PR: Forestry major or consent; senior standing. Analysis and planning for management of forest resources. Primarily involves carrying out a major management problem assignment, with actual forest tracts as focal point.

330. *Advanced Principles of Forestry Economics.* II. 3 hr. PR: Econ. 51 or equiv.; F. Man. 230 or equiv. Intensive study of both micro- and macroeconomics of forestry.

Wood Science (Wd. Sc.)

121. *Wood Technology.* II. 3 hr. PR: Biol. 51. For students other than those taking the wood industries and wood science options; designed to provide familiarity with the technical aspects of wood utilization.

123. *Wood Identification.* I. 3 hr. PR: Wood Industry major or consent; Biol. 51. Identification of commerical timbers of the U.S.; basic properties and uses of different woods.

132. *Primary Conversion and Grading.* II. 3 hr. PR: Forestry major or consent. Principles of the conversion of raw materials in log form to primary wood products. Elements of the grading of raw materials and primary products. Production planning and control.

134. *Secondary Manufacturing Processes.* II. 3 hr. PR: Wd. Sc. 123 or consent. Detailed study of the materials and processes involved in manufacture of secondary wood products.

141. *Properties of Wood.* I. 3 hr. PR: Wood Industry major or consent; Phys. 1, Wd. Sc. 123. Physical and mechanical properties of wood.

200. *Forest Measurement Field Practice.* S. 3 hr. PR: Wood Industry major, Biol. 51, C.E. 1, F. Man. 122. Application of surveying and mensurational practices with emphasis on field problems.

201. *Wood Industries Field Trip.* S. 1 hr. PR: Wd. Sc. 234. A one-week trip to observe manufacturing methods and techniques of commerical wood industry plants. Plants visited include furniture, plywood, veneer, hardboard, particle board, pulp and paper, sawmilling, and preservation.

230. *Wood Machining.* II. 2 hr. PR: Consent. Introduction to basic concepts of wood machining with emphasis on production equipment and furniture manufacturing.

231. *Wood Finishing.* I. 3 hr. PR: Wd. Sc. 121 or 123. Surface preparation, composition of finishing materials, equipment, techniques, defects, troubleshooting, and quality control.

232. *Wood Adhesion: Theory and Practice.* I. 2 hr. PR: Wd. Sc. 123 and 141. Detailed theoretical introduction and examination of different types of adhesives and gluing techniques used in the wood industry.

234. *Statistical Quality Control.* I. 3 hr. PR: Forestry major or consent; Wd. Sc. 134. Methods used to control quality of manufactured wood products. Control charts of variables and attributes. Acceptance sampling techniques.

235. *Light-Frame Wood Construction.* I. 2 hr. PR: Forestry major or consent. Use of wood in light-frame construction. Basic design procedures and construction methods.

240. *Wood Moisture Relationships.* II. 3 hr. PR: Wd. Sc. 123. Principles involved in the relation between wood and moisture, and purposes, effects, and methods of seasoning.

251. *Forest Products Protection.* II. 3 hr. PR: Wd. Sc. 123, 134. Biological organisms responsible for deterioration of wood products, their control by preservative methods, and study of fire retarding methods.

320. *Wood Microstructure.* I. 3 hr. PR: Wd. Sc. 123; senior standing. Detailed examination of wood microstructure as it relates to processing, behavior, and identification.

Wildlife Management (W. Man.)

122. *Ornithology.* II. 3 hr. PR: Biol. 1, 2, or consent. Identification, distribution, and ecology of birds (particularly of forest lands.)

131. *Wildlife Management.* I. 3 hr. PR: Biol. 2 *(Students majoring in wildlife management may not take this course for credit.)* Basic principles of handling wildlife as a forest crop, including population of dynamics, ecological relationships, social behavior, habitat manipulation, and game administration.

151. *Attitudes Toward Wildlife.* I. 3 hr. A consideration of our changing perception of and relationships toward wild animals.

213. *Wildlife Ecology.* I. 4 hr. PR: Wildlife major or consent; Biol. 1 and 2. Basic principles of ecology and their application to wildlife. Field and laboratory studies of major ecosystems important to wildlife, including management of these ecosystems for wildlife.

222. *Field Ornithology*. S. 3 hr. PR: Biol. 2 or consent. Intensive field studies in recognition through sight, song, and behavioral patterns of birds, and their ecology in the central Appalachians.

224. *Forest Zoology*. I. 3 hr. PR: Biol. 2 or consent. Relationships of fish, amphibians, and reptiles to the forest, with emphasis on the ecology, taxonomy, evolution, natural history, and field identification of these groups. Laboratory emphasizes natural history and anatomy of fish, amphibians, and reptiles.

225. *Mammalogy*. II. 3 hr. PR: Biol. 2 or consent. Relationships of mammals to the forest, with emphasis on ecology, taxonomy, evolution, natural history, and anatomy of mammals. Laboratory emphasizes natural history and anatomy of mammals.

228. *Wildlife Policy and Administration*. II. 3 hr. Study of the organization, authority, policies, programs and administration of public agencies and private organizations concerned with fish and wildlife. Emphasis is on the legal and political role in making wildlife management decisions.

231. *Wildlife Techniques*. I. 3 hr. PR: Wildlife major or consent; W. Man. 213. Field and laboratory techniques necessary in management and study of wildlife; collection of field data, mapping, censusing, habitat evaluation, literature and scientific writing.

234. *Principles of Wildlife Management*. II. 3 hr. PR: Wildlife major or consent; W. Man. 213, 231. Major game animals and problems and principles involved in their management.

312. *Wildlife Population Ecology*. II. 3 hr. PR: W. Man. 131, Stat. 211, or equiv. Theory of population growth, population change, intraspecific and interspecific relationships involved in natural regulation of populations, and effects of exploitation on wildlife populations. *(Offered in Spring of even years.)*

333. *Quantitative Ecology*. I. 3 hr. PR: Stat. 311 or equiv., and W. Man. 213 or equiv. A survey of techniques and strategies for the quantitative analysis of complex ecological data sets. *(Offered in Fall of odd years.)*

370. *Wildlife Seminar*. I. 1 hr. per sem.; (4 hr. max.). PR: Consent. Discussion of current developments in wildlife management.

Recreation and Parks (Rc. & Pk.)

43. *Leisure and Human Behavior*. I. 3 hr. An interdisciplinary approach analyzing the role of leisure in modern American life. Play, games, work, and recreation are studied as aspects of human behavior affected by global, physical, societal, and personal concerns.

44. *Introduction to Recreation and Park Services*. II. 4 hr. An overview of recreation in modern life: its philosophy, environments, historical antecedents, service delivery systems, special settings and populations, leadership, program, and professional challenges. Includes a field placement with a local recreation agency.

56. *Nature Recreation and Camping*. I. (Alternate Years.) 3 hr. Lecture and workshop. Introduction to organized camping movement including purposes, campsites, equipment, programs, and leadership. Exploration of nature recreation and its relationship to community recreation and camping programs.

57. *Social Recreation*. II. 3 hr. Lecture and workshop course. Place of social recreation activities, informal dramatics, crafts, and music in community center, playground, camp or school extracurricular programs.

100. *Approved Summer Park Experience and Report*. S. 1 hr. PR: Recreation and parks junior or consent. One summer's experience in management of a park or related recreational enterprise followed by a written report.

142. *Fundamentals of Nature Interpretation.* II. 3 hr. PR: Recreation and parks junior or consent. Methods and techniques of interpreting the natural environment to individuals and groups.

201. *Wildland Search and Rescue Techniques.* I. 2 hr. PR: Consent. Acquaints future forest, park, and recreation area professionals with the safe methods, practices, and procedures of search and rescue of lost and/or injured persons. Some weekend field trips required.

202. *Recreation Internship.* I. 3 hr. PR: Rc. & Pk. 43, 44, 251/263, 233/235/271. Supervised, full-time leadership responsibility with a recreation agency for a minimum of eight weeks. Program must relate to the student's curriculum option and must be approved in advance by the program coordinator.

203. *Professional Synthesis.* I, II, S. 3 hr. PR or Conc.: Rc. & Pk. 202. A capstone course for seniors that involves the synthesizing of professional training and field work experiences.

216. *Philosophy of Recreation.* II. 3 hr. PR: Consent. Interpretation of recreation as a basic part of the living process; importance to individual community and national welfare; social and economic significance.

224. *Outdoor Recreation in Modern Society.* II. 3 hr. PR: Consent. Emphasis on the physical, social, and psychological implications of areas and activities. Content ranges from wilderness areas to urban parks. Related research is reviewed, a current issue debated, and a new activity or skill experienced.

233. *Wildland Recreation Management.* I. 3 hr. Topics include an analysis of administrative agencies concerned with wildlife management, methods of ameliorating human impact on outdoor recreation resources, discussion of philosophies underlying wilderness recreation, and a review of contemporary controversies concerning wildlands.

235. *Administration of Urban Recreation Services.* I. 3 hr. PR: 12 hr. of recreation and parks courses or consent. Principles of administration as applied to the operation of recreation and park agencies, including legal foundations, policy, organization, personnel, finance and programs of services.

241. *Recreational Services for Special Populations.* I. 3 hr. PR: Consent. Introductory analysis of current therapeutic recreation services; attentiveness to the need for broadening recreation and park services to include members of special populations; familiarization with the planning consideration for the conduct of such services.

242. *Historical and Cultural Interpretation.* II. 3 hr. PR: Recreation and parks major or consent. Methods of locating source materials for reconstructing the historical, cultural, and physical aspects of an area for an interpretive center; preparing brochures, displays, and nature trails to facilitate interpretive activities.

248. *Environmental Concerns In Outdoor Recreation.* I. 3 hr. PR: Consent. Understanding and interpreting environmental concerns within the context of outdoor recreation.

251. *Recreation Leadership.* I. 3 hr. PR: Recreation and parks major or consent. Leadership functions and techniques, group dynamics, supervision, and use of volunteers. Theory and practice are related through a field placement with a local recreation agency.

263. *Program Planning.* II. 3 hr. PR: Recreation and parks major or consent. Fundamentals for general program planning; considers needs, facilities, age groups, local customs, climatic factors, etc. Planning involved in playgrounds, indoor centers, playfields, parks, hospitals, voluntary agencies, industry, and campus.

265. *Planning and Design of Recreation Places.* II. 3 hr. PR: Recreation and parks major or consent. Study of planning and design concepts, standards and guidelines, use continuum, grants-in-aid, and planning of selected areas and facilities: parks, pools, centers, and recreation resource areas development.

271. *Administration of Camping Services.* II. 3 hr. PR: Recreation and parks major or consent. Principles involved in modern camping programs, and organization and administration of camps.

Division of Plant and Soil Sciences

Faculty

Mannon E. Gallegly, Jr., Ph.D. (U. Wisc.), *Chairperson, Division of Plant and Soil Sciences; Professor of Plant Pathology and Plant Pathologist.*

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Adjunct Faculty

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Orus L. Bennett, Ph.D. (WVU), *Adjunct Professor of Agronomy.*
Douglas G. Boyer, Ph.D. (WVU), *Adjunct Assistant Professor of Agronomy.*
Billy A. Butt, B.S. (Purdue U.), *Adjunct Professor of Entomology.*
Frank W. Glover, Jr., B.S. (WVU), *Adjunct Professor of Agronomy.*
Edward Hacskaylo, Ph.D. (Geo. Wash. U.), *Adjunct Professor of Mycology.*
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Tong-Man Ong, Ph.D. (Ill. St. U.), *Adjunct Associate Professor of Genetics.*
Ralph S. Scorza, Ph.D. (Purdue U.), *Adjunct Assistant Professor of Horticulture.*
William G. Sorenson, Ph.D. (U. Tex.), *Adjunct Assistant Professor of Genetics.*
Tom Staley, Ph.D. (Ore. St. U.), *Adjunct Assistant Professor of Agricultural Microbiology.*
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Walter M. Winant, M.S. (U. Md.), *Adjunct Assistant Professor of Agronomy.*
Sara E. Wright, Ph.D. (Tex. St. U.), *Adjunct Assistant Professor of Bacteriology.*

Bachelor of Science in Agriculture

PLANT AND SOIL SCIENCES CURRICULUM

Students enrolled in this degree program may select courses to develop interest areas in *agronomy, horticulture, soil science, environmental protection*, or *basic science* to prepare for positions involving various phases of commercial crop production and use, soil conservation, pedology and soil survey, land reclamation and revegetation, land management and classification, fertilizer use, weed control, insect and disease control, plant breeding, farm management, and turf and golf course maintenance. Graduates may be self employed or develop careers with commercial industries involved with the development and distribution of pest-control chemicals, fertilizers, seeds and plants, and nursery, floral, garden, and turf products. Also, positions as estate and farm managers, land reclamationists, city and county planning technicians, park, and golf course superintendents, and environmental protectionists are available to graduates of this program, as well as many different positions with state and federal governmental agencies.

By judicious selection of courses the student may also acquire the necessary background in the *basic sciences* to enter professional or graduate programs of study in such fields as agricultural biochemistry, crop science entomology, genetics, horticulture, mycology, plant pathology, and soil science.

For all students in the curriculum in Agriculture the program of courses taken in the freshman year is essentially the same. However, students are urged to select the appropriate adviser so that they may develop their program of study in one of the areas described above while meeting the requirements for the curriculum:

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Group A)	12
Social and Behavioral Sciences (Group B)	12
Natural Sciences (Group C included)	24
(Must elect a minimum of 8 hours in biology; 8 hours in chemistry; 3 hours in college algebra or equivalent.)	
Courses in Agriculture	45
Elect a minimum of 3-credit course, excluding Assigned Topics, in each of the following: 1. Animal Science; 2. Plant Science; 3. Soil Science; and 4. Agricultural Economics. Elect additional courses to obtain a total of 45 hours in Agriculture	
General Physical Education	2
Free Electives*	35
Total	136

*May elect to take courses in Military Science or Air Force Aerospace Studies (ROTC).

Specific requirements for each of the program options are as follows:

Agronomy, Crop Science: Phys. 1, 2; Geol. 1, 2; Gen. 171, 290; Chem. 133, 134, 135, 136; Biol. 169; P. Pth. 201; Ento. 204; Ag. Ec. 206.

15 hours of upper-division Agronomy courses.

Agronomy, Soil Science: Phys. 1, 2; Geol. 1, 2; Gen. 171; Chem. 133, 134, 135, 136; Biol. 169; Ento. 204; Ag. Ec. 206.

15 hours of upper-division Agronomy courses.

Horticulture: Biol. 2, 169; Chem. 131 or 133, 135; C.S. 1 or 5; Ento. 204; Hort. 107, 204; 6 additional hr. P. Pth. 201.

Environmental Protection: Chem. 131 or 133, 135; C.E. 245, 251; Ento. 204, 212; Bact. 141, 201; P. Pth. 201; W. Man. 213; Agron. 251.

Basic Science: Math. 3, 4, 15, 16; Chem. 133, 134, 135, 136; Phys. 1, 2; Biol. 169; Bact. 141; Ag. Bi. 210; Stat. 101.

Courses of Instruction

Assigned Topics

In order to be eligible to register in Assigned Topics (Pl. Sc. 180) the student must: (1) be in good standing, and (2) obtain approval of the appropriate Division Chairperson before registration (see below).

Agricultural Microbiology (Ag. Micro.)

141. *General Bacteriology.* I, II. 4 hr. PR: Inorganic chemistry. Introductory morphological, cultural, and physiological characteristics of bacteria; application of bacteriology to agriculture, home economics, sanitation, and health.

201. *Environmental Microbiology.* II. 4 hr. PR: Bact. 141 or consent. Microbiology as applied to soil, water, waste-water, sewage, air, and the general environment. Occurrence, distribution, ecology, and detection of microorganisms in these environments.

347. *Food Microbiology.* I. 4 hr. PR: Bact. 141, biochemistry or consent. Ecology and physiology of microorganisms important in the manufacture and deterioration of foods. Techniques for the microbiological examination of food. *(Open in Fall of odd years.)*

348. *Sanitary Bacteriology.* I. 3 hr. PR: Bact. 141. Bacteriology and health hazards associated with food handling, water treatment, and sanitary waste disposal. *(Offered in Fall of even years.)*

Agronomy (Agron.)

2. *Principles of Soil Science.* II. 4 hr. PR: Inorganic chemistry. An introduction to soil science. 3 lec., 1 lab.

10. *Forest Soils.* I. 3 hr. PR: Inorganic chemistry. Principles of soil science with particular reference to forest soils. 2 lec., 1 lab.

115. *Soil Judging, Mapping, and Interpretation.* I. 3 hr. PR: Agron. 2 or 10. Techniques in observing and describing soil profiles, mapping by modern systems and interpreting basic soil surveys for varied soil use.

210. *Soil Fertility.* I. 3 hr. PR: Agron. 2 or 10. Soil properties in relation to fertility and productivity of soils; evaluation of soil fertility; production of fertilizers and their use in increasing soil fertility and productivity.

212. *Soil Conservation and Management.* II. 3 hr. PR: Agron. 2 or 10. Using soil technology to solve soil management problems relating to cropping systems. Field diagnosis of soil problems stressed. 2 lec., 1 lab.

230. *Soil Physics.* II. 3 hr. PR: Agron 2 or 10. Physical properties of soils; water and air relationships and their influence on soil productivity. *(Offered in Spring of even years.)*

250. *Turfgrass Management.* I. 3 hr. PR: Agron. 2 or consent. Establishment, maintenance, and adaption of grasses and legumes for lawns, golf courses, parks, athletic fields, and roadsides. Associating differential plant responses with soil, climatic, and biotic factors. *(Field trips arranged.)*

251. *Weed Control.* I. 3 hr. PR: Pl. Sc. 52, Agron. 2, or consent. Fundamental principles of weed control. Recommended control measures for and identification of common weeds. 2 lec., 1 lab. *(Offered in Fall of odd years.)*

252. *Grain and Special Crops.* II. 3 hr. PR: Pl. Sc. 52, Agron. 2, or consent. Advanced study of methods in the production of grain and special crops. Varieties, improvement, tillage, harvesting, storage, and use of crops grown for seed or special purposes. *(Offered in Spring of even years.)*

254. *Pasture and Forage Crops.* I. 4 hr. PR: Pl. Sc. 52, Agron. 2, or consent. All phases of pasture and forage crop production, including identification, seeding, management, use, seed production, and storage of forage crops. 3 lec., 1 lab.

255. *Elements of Pedology.* II. 3 hr. PR: Consent. Pedologic definitions and principles will be applied to advanced planning, practices, and continuing use of highly disturbed or man-made soils being created by such activities as mining and urbanization. *(One all-day field trip required.)*

301. *Geotechnic.* I. 3 hr. PR: Consent. A unified approach to various aspects of soil formation and influence of formative factors on the nature of soils and their use as engineering materials. Course serves as a common meeting ground for students in the various disciplines concerned with earth science. 3 lec. *(Offered in Fall of odd years.)*

315. *Soil Genesis and Classification.* I. 3 hr. PR: Agron. 2 or 10. Origin and formation of soils. Study of soil profiles and soil-forming processes in field and laboratory. Principles of classification and techniques of soil mapping. 2 lec., 1 lab. *(Saturday field trips required.) (Offered in Fall of even years.)*

Entomology (Ento.)

152. *Forest Entomology.* II. 3 hr. PR: F. Man. 211. *(This course is primarily designed for forestry students.)* Relationships between insects and the forest; recognition and control of important species.

204. *Principles of Entomology.* I. 4 hr. PR: Biol. 1 and 2 or equiv. Basic course dealing with the anatomy, morphology, physiology, reproduction, systematics, ecology, and control of insects.

210. *Insects Pests in the Agroecosystem.* I. 3 hr. PR: Ento. 204 or consent. Life cycle, damage, and economic impact of pestiferous insects in the agroecosystem. Included are insect pests of agricultural and ornamental plants, stored products, structures, and livestock. 2 lec., 1 lab.

212. *Pest Managment.* II. 3 hr. Ento. 204 or consent. An in-depth look at current problems and solutions in controlling insect pests in an environmentally compatible manner. Management techniques include cultural, mechanical, physical, biological, regulatory, and chemical practices. 3 lec.

390. *Special Topics in Entomology.* I, II, S. 2-6 hr. PR: Ento. 204 or equiv., or consent. Each of the following courses is given every other year. Exopterygota; Endopterygota Part I, Part II; Larval Insects; Acarology; Araneology; Pesticides in the Environment; Insect Morphology; Insect Physiology; Medical Entomology; Bee Keeping.

Genetics (Gen.)

171. *Principles of Genetics.* II. 4 hr. PR: 8 hr. biological science. The fundamentals of inheritance.

290. *Crop Breeding.* II. 3 hr. PR: Gen. 171 or 321. Methods and basic scientific principles involved in improvement of leading crops through hybridization, selection, and other techniques. *(Offered in Spring of even years.)*

321. *Basic Concepts of Modern Genetics.* I. 3 hr. PR: 8 hr. biological science and 1 year chemistry. Independent inheritance, linkage. Chemical nature of genetic material. Control of phenotype by genetic material. Gene action and coding of genetic material.

325. *Human Genetics*. II. 3 hr. PR: Gen. 171 or 321 or consent. Study of genetic system responsible for the development of phenotype in man. *(Offered in Spring of odd years.)*.

335. *Population Genetics*. II. 3 hr. PR: Gen. 171 or 321 or consent. Relationship of gene and genotype frequencies in populations of diploid organisms, and effects of mutation, migration, selection, assortive mating, and inbreeding in relation to single gene pairs. Application of these concepts to multigenic inheritance of quantitative traits. *(Offered in Spring of even years.)*

Horticulture (Hort.)

107. *General Horticulture*. I. 3 hr. PR: Biol. 1, or consent. Principles underlying present-day horticulture practice with special emphasis on how basic discoveries in plant science have been applied in horticulture.

115. *Judging and Identification of Apple Varieties*. I. 1 hr. Two laboratory periods half of semester. Identification and judging of apple varieties.

116. *Flower Judging*. II. 1 hr. One laboratory period per week. Identification and judging of flowers with emphasis on the aesthetic values which underlie desirability in a variety.

117. *Vegetable Identification and Judging*. I. 1 hr. Identification and judging the common vegetables and the test associated with olericulture in West Virginia. Emphasis is placed on the cultural practices associated with top quality vegetables.

151. *Floral Design*. I. 3 hr. Basic course in flower arrangement to cover occasions for the home and retail flower shop.

162. *Herbaceous Plant Materials*. I. 3 hr. Identification, description, adaptability, and evaluation of selected herbaceous annuals and perennials with emphasis on their use as design elements.

204. *Plant Propagation*. II. 3 hr. PR: Pl. Sc. 52 or consent. Study of practices of plant propagation and factors involved in reproduction in plants. *(Offered in Spring of even years.)*

242. *Small-Fruits*. I. 3 hr. PR: Pl. Sc. 52, Hort. 107, or consent. Taxonomic, physiological, and ecological principles involved in production and handling of small-fruits. 2 lec., 1 scheduled lab. *(Offered in Fall of even years.)*

243. *Physiology of Vegetables*. I. 3 hr. PR: Pl. Sc. 52. Physiological and ecological principles involved in production of vegetable crops. 2 lec., 1 scheduled lab. *(One 3-day field trip required.) (Offered in Fall of even years.)*

244. *Handling and Storage of Horticultural Crops*. I. 3 hr. PR: Pl. Sc. 52, Chem. 16. Characteristics of perishable crops. Methods and materials used to maintain quality. 2 lec., 1 scheduled lab. *(Offered in Fall of odd years.)*

245. *Greenhouse Management*. II. 3 hr. PR: Two semesters of Inorganic Chemistry and Hort. 107 or consent. Greenhouse as a controlled plant environment. How to manipulate factors influencing plant growth and development within specialized environments of greenhouses.

246. *Tree Fruits*. I. (Alternate Years.) 3 hr. PR: Pl. Sc. 52 or consent. Principles and practices involved in production of tree fruits. 2 lec., 1 scheduled lab. *(Offered in Fall of even years.)*

301. *Post-Harvest Physiology*. II. 3 hr. Physiology and biochemistry of harvested crops. 1 lec., 2 labs. *(Offered in Spring of odd years.)*

Plant Pathology (P. Pth.)

153. *Forest Pathology*. I. 3 hr. PR: Biol. 2, F. Man. 211. Important diseases of forest and shade trees. Causes and methods of control.

201. *General Plant Pathology*. I. 4 hr. Nature and causes of plant diseases; methods of control.

301. *Diseases of Economic Plants*. I, II, S. 1-3 hr. per sem.; 2 hr. in Summer. PR: P. Pth. 201 or 303 or consent. Recognition, cause, and control of diseases of economic plants. [Sem. I—Diseases of vegetable crops and of trees and small fruits; Sem. II—Diseases of ornamental plants and field and forage crops; S—Diseases of forest trees. Students may register for 1-3 hr. in Sem. I and II, 2 hr. in Summer, until 8 hours of credit are accumulated.] *(Offered in 1983-84 and in alternate years.)*

302. *Principles of Plant Pathology*. II. 4 hr. PR: P. Pth. 153, 201, or 303, or consent. Primarily for graduate students and seniors majoring in biology or agricultural science. Nature of disease in plants with practice in laboratory methods. *(Offered in Spring of even years.)*

303. *Mycology*. I. 4 hr. Lectures and field and laboratory studies of parastic and saprophytic fungi.

309. *Nematology*. II. 3 hr. Primarily for graduate students majoring in the agricultural sciences or biology. Nematode taxonomy, bionomics, and control, with particular emphasis on plant parasitic forms. *(Offered in Spring of odd years.)*

Plant Science (Pl. Sc.)

52. *Principles of Plant Science*. I, II. 4 hr. PR: Biol. 1. Basics of the nature, history, classification, role, distinction, structure and function, reproduction, improvement, culture, pests, storage and handling, production and marketing, and utilization of agricultural plants.

180. *Assigned Topics*. I, II, S. 1-4 hr. *(Students eligible for this course must be in good standing and have prior division approval of the proposed outline.)* Special studies in agronomy (crops and soils), bacteriology, horticulture, or plant pathology.

195. *Seminar*. I, II. 1 hr. A seminar aimed at exploring, through a discussion format, current problems in agriculture and agricultural environmental protection.

200. *Recognition and Diagnosis of Plant Disorders*. I. 4 hr. PR: P. Pth. 201 and Ento. 204. Creates an ability for the student to use systematic inspection to determine cause or causes of a plant disorder.

201. *Principles and Methods of Plant Pest Control*. II. 4 hr. PR: P. Pth. 201 and Ento. 204. Concepts of control and how they are implemented by exclusion, eradication, protection, and immunization.

Division of Resource Management

Faculty

Dale K. Colyer, Ph.D. (U. Wisc), *Chairperson, Professor of Agricultural Economics and Agricultural Economist.*

P. Vernon Armbrester, M.S. (WVU), *Professor of Agricultural Education and Associate Dean, Academic Programs.*

Donald R. Armstrong, M.L.A. (Iowa St. U.), *Associate Professor of Landscape Architecture.*

Alfred L. Barr, Ph.D. (Okla. St. U.), *Professor of Agricultural Economics and Associate Director, Agricultural and Forestry Experiment Station.*

Thomas L. Bean, M.S. (WVU), *Associate Professor of Agricultural Education and State Safety Extension Specialist—Agricultural Education.*

Kathleen K. Bissonnette, Ph.D. (WVU), *Assistant Professor of Agricultural Economics and Extension Energy Specialist.*

Robert Burton, Ph.D. (Purdue U.), *Assistant Professor of Agricultural Economics and Agricultural Economist.*

Russell C. Butler, Ph.D. (Cornell U.), *Professor Emeritus of Agricultural Education.*

James H. Clarke, Ph.D. (U. Minn), *Professor Emeritus of Agricultural Economics*

Clifford W. Collier, Jr., M.L.A. (U. Ga.), *Professor and Extension Landscape Architect.*

Robert G. Diener, Ph.D. (Mich. St. U.), *Professor of Agricultural Engineering and Agricultural Engineer.*

Gerald V. Eagan, Ph.D. (U. Tenn.), *Associate Professor of Agricultural Economics and State Extension Specialist—Agricultural Economics.*

Kendall C. Elliott, M.S.Ag.E. (WVU), *Associate Professor of Agricultural Engineering and Associate Agricultural Engineer.*

Roy E. Emerson, M.S. (Cornell U.), *Associate Professor Emeritus of Agricultural Engineering.*

Homer C. Evans, Ph.D. (U. Minn.), *Professor Emeritus of Agricultural Economics.*

Anthony Ferrise, M.S. (WVU), M.S. (WVU), *Associate Professor of Agricultural Economics and State Extension Specialist—Community Development.*

Kenneth J. Hock, Ph.D. (U. Ariz.), *Associate Professor of Agricultural Economics and Agricultural Economist.*

Anwarul Hoque, Ph.D. (Mich. St. U.), *Associate Professor of Agricultural Economics and Associate Agricultural Economist.*

Robert L. Jack, Ph.D. (Penn St. U.), *Professor of Agricultural Economics and Agricultural Economist.*

Alexander G. Karther, M.F.A. (U. Okla.), *Associate Professor of Landscape Architecture.*

Warren G. Kelly, Ed.D. (U. Mo.), *Professor of Agricultural Education and Education.*

Marion L. Kimmons, Ph.D. (U. Mo.), *Associate Professor of Agricultural Mechanics.*

Alon Kvashny, Ed.D. (WVU), *Professor of Landscape Architecture.*

Layle D. Lawrence, Ph.D. (LSU), *Professor of Agricultural Education and Education.*

George W. Longenecker, M.F.A. (U. Ill.), *Professor of Landscape Architecture.*

Wesley Lynch, M.S. (Mich. St. U.), *Assistant Professor of Agricultural Economics and Extension Housing Specialist.*

Steven B. McBride, M.L.A. (U. Mass.), *Associate Professor of Landscape Architecture.*

O. Claude McGhee, Ph.D. (Ohio St. U.), *Professor of Agricultural Education and Education.*

Kenneth D. McIntosh, Ph.D. (U. Wisc.), *Professor of Agricultural Economics and Agricultural Economist.*

Robert H. Maxwell, Ph.D. (Cornell U.), *Professor of Agricultural Education and Associate Dean.*

Ernest J. Nesius, Ph.D. (Iowa St. U.), *Professor Emeritus of Agricultural Economics.*

Paul E. Nesselroad, Ph.D. (Penn St. U.), *Professor of Agricultural Economics and Agricultural Economist.*

Jackie H. Paules, M.S. (Penn St. U.), *Associate Professor of Landscape Architecture.*

Donald L. Peterson, *Adjunct Associate Professor, Agricultural Engineer, USDA Appalachian Fruit Research Laboratory.*

Leonard M. Sizer, Ph.D. (St. U. Iowa), *Professor Emeritus of Sociology.*

Mary E. Templeton, M.S. (WVU), *Professor of Agricultural Economics and Agricultural Economist.*

George E. Toben, M.S. (U. Ill.), *Professor Emeritus of Agricultural Economics.*

F. Wayne Weber, M.S. (WVU), *Assistant Professor of Agricultural Economics and Assistant Agricultural Economist, ERS, USDA.*

Virgil Whetzel, M.S. (WVU), *Assistant Professor of Agricultural Economics and Assistant Agricultural Economist, ERS, USDA.*

Delmar R. Yoder, Ph.D. (U. Wisc.), *Associate Professor of Agricultural Economics and Extension Specialist—Resource Development.*

Charles B. Yuill, M.L.A. (U. Mass.), *Assistant Professor of Landscape Architecture.*

Programs

The Division of Resource Management offers degree programs in Agricultural Education, Landscape Architecture, and Resource Management.

The curriculum in Agricultural Education prepares students to teach vocational agriculture. The Landscape Architecture curriculum prepares students for a professional career in that field. Two curriculums in Resource Management provide training in agricultural economics, agribusiness, farm management, rural development, agricultural mechanics, and extension education. These prepare students to pursue graduate studies or work in the fields of agriculture, business, industry, government, finance, extension, and related areas.

The Bachelor of Science program is recommended for students who are planning to pursue graduate studies or to work in more technically oriented professions. The Bachelor of Science in Agriculture curriculum is for those wishing more general and less scientifically oriented training.

Bachelor of Science

RESOURCE MANAGEMENT CURRICULUM

The curriculum of bachelor of science, with its flexible design, will provide the student with the opportunity to acquire the necessary background in mathematics, statistics, computer science, and economic theory and modern concepts of science in preparation for professional or graduate study. Selection of individual courses is the responsibility of the student in consultation with the adviser.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
General Physical Education	2
Arts and Humanities (Core A)	12
Social and Behavioral Sciences (Core B)	20
(The student shall elect a minimum of one course in each: History, Political Science, Psychology, and Sociology and Anthropology.)	
Natural Sciences (Core C)	26
(The student shall elect two courses in Calculus and two in Statistics.)	
Computer Science	6
Courses in College of Agriculture and Forestry	24
Electives*	32
Total	128

*May elect courses in Military Science (ROTC) or Air Force Aerospace Studies (ROTC).

Bachelor of Science in Agriculture

RESOURCE MANAGEMENT CURRICULUM

The Resource Management curriculum provides a student with the opportunity to acquire the necessary background for employment in a variety of fulfilling and stimulating careers. Considerable latitude is provided for students to obtain supportive courses in agriculture and other University offerings in planning the curriculum. Studies in this curriculum include the areas of Agricultural Economics and Agribusiness, Agricultural Mechanics, and Extension Education. Students may select from a number of areas of concentration in the curriculum.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
General Physical Education	2
Arts and Humanities (Core A)	12
Social and Behavioral Sciences (Core B)	12
Natural Sciences (Core C)	12
(Must elect a minimum of 4 hours in Biology, 4 hours in Chemistry, and 3 hours in college Algebra or equivalent.)	
Foundation requirements in Agriculture	15
(Elect a minimum of 3-credit course, excluding Assigned Topics, in each of the following: 1. Animal Science; 2. Plant Science; 3. Soil Science; 4. Agricultural Economics; and 5. Agricultural Mechanics.)	
Additional courses in Agriculture	30
(This is a minimum credit in agriculture above agricultural courses identified in the foundation requirements in agriculture. These courses may be elected to prepare for special interest areas.)	
Restricted Electives	15
(To be selected from computer science, mathematics, business and economics.)	
Electives*	32
	136

*May elect courses in Military Science (ROTC) or Air Force Aerospace Studies (ROTC).

Fields of Study

Agricultural Economics and Agribusiness

There are four areas of concentration which provide specialized training for careers in agricultural economics: General Agricultural Economics, Farm Management, Agribusiness, and Rural Development/Resource Economics. The general agricultural economics area provides a basic background for a variety of agriculturally related careers. The farm management and agribusiness areas provide specialized training for careers in farming, credit, government, or business. The rural development/resource economics area provides training for careers in community development, rural planning, and management of natural resources. Employment opportunities exist with extension, local, state, national, and international agencies.

Students selecting this field of study should take Economics 54 and 55. Students should also develop basic competencies in quantitative methods and communicative skills, such as: accounting, computer science, statistics, mathematics, and oral and written communications. Each student should complete at least one course in each of these areas as part of University Core or as part of the electives. Students preparing for graduate study should take calculus and intermediate economic theory.

Areas of Concentration and Suggested Courses

General Agricultural Economics: Ag. Ec. 104, 200 (or 211), 231, 240, and 271.

Farm Management: Ag. Ec. 104, 206, 240 (or 231), 261, and 271 (or 200).

Agribusiness: Ag. Ec. 104, 231, 240, 261, and 271 (or 211).

Rural Development/Resource Economics: Ag. Ec. 104 (or 240), 200, 211, 261, and 271.

Agricultural Mechanics

Agricultural Mechanics is a four-year major developed around the Resource Management curriculum. It is designed to give broad training in agricultural sciences and specialization training in agricultural mechanics. It prepares the student for farm management, extension work, farm machinery and equipment sales and service, electric power use, work with federal agencies such as Soil Conservation Service, agricultural loan office with banks, food and non-food processing plants, vocational agricultural teachers in multi-teacher departments, and other related fields to agriculture.

Suggested Courses

Agr. M. 152—Shop Theory and Methods
Agr. M. 253—Advanced Farm Machinery
Agr. M. 259—Farm Structures
Agr. M. 270—Electricity in Agriculture
Agr. M. 275—Agricultural Engines
C.E. 5—Land Surveying

Extension Education

Persons who work in the Cooperative Extension Service are involved in out-of-school education for youth and adults. Extension educators conduct agricultural education programs and community development projects designed to enhance rural living.

Students interested in employment as a county agent may acquire needed competencies by pursuing course work in rural sociology, educational psychology, adult education, community development, business, economics, speech communication, technology education, public relations, and news writing.

Students who are interested in employment as a 4-H Club Agent should pursue course work in the same areas as prescribed for county agents with the exception of a basic course in business and economics. Additional competencies needed to work efficiently with youth groups may be acquired by taking courses in adolescent psychology and leadership development.

Suggested Courses

Ag. Ed. 260—Principles of Cooperative Extension
Ag. Ed. 261—Methods and Materials in Extension Education
Ag. Ed. 362—Program Building in Cooperative Extension

Bachelor of Science in Agriculture

AGRICULTURAL EDUCATION CURRICULUM

The main purpose of agricultural education is to educate those who would be teachers in vocational agriculture.

An effective vocational agriculture teacher can assist in the economic and social development of a community. One can accomplish this by teaching a total program of vocational agriculture, in and through the high school. Day, young farmer, adult farmer, and off-farm agricultural occupations classes and groups, taught through supervised occupational experience programs, are the tools with which the vocational teacher helps build a more desirable community.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Core A)	12
Social and Behavioral Sciences (Core B)	12
Natural Sciences (Core C included)	24
(Must elect a minimum of 8 hours in Biology; 8 hours in Chemistry; 3 hours in college Algebra or equivalent.)	
Courses in Agriculture	45
Elect a minimum of a 3-credit course, excluding Assigned Topics in each of the following: 1. Animal Science; 2. Plant Science; 3. Soil Science; and 4. Agricultural Economics. Elect additional courses to obtain the total of 45 hours in Agriculture.	
General Physical Education	2
Electives*	35
Total	136

*May elect courses in Military Science (ROTC) or Air Force Aerospace Studies (ROTC).

Students completing this program will meet requirements for certification by the West Virginia Department of Education. The program provides graduates with the opportunity to become qualified to teach in the broad field of vocational agriculture as well as to become especially prepared to teach in agricultural production and management, animal processing, agricultural mechanics, agricultural sales and services, conservation, horticulture produce industry, or ornamental horticulture. Courses are also offered in extension education for any University student planning for a career in cooperative extension.

A student selecting the comprehensive field for vocational agriculture teaching shall complete the above listed curriculum requirements. It is also suggested that each student choose one of the seven options listed below to guide the student's program of study.

Students in this curriculum are advised to refer to the section of the *WVU Undergraduate Catalog* entitled: "Programs for Secondary School Teachers" in the Department of Curriculum and Instruction, College of Human Resources and Education:

	Hours
A. Agricultural Production and Management	17
B. Animal Processing	17
C. Agricultural Mechanics	17
D. Agricultural Sales and Service	17
E. Conservation	17
F. Horticulture Produce Industry	17
G. Ornamental Hortculture	17

Bachelor of Science in Landscape Architecture

LANDSCAPE ARCHITECTURE CURRICULUM

The profession of landscape architecture offers the opportunity to be involved in improving the quality of the environment. The profession deals with the planning and sensitive design of land areas for our use and the esthetic enrichment of our needs. This may range from the planning and design at the regional macro-scale to the urban micro-detail.

The primary educational goals of the curriculum are:

To prepare students who are professionally proficient and technically competent in the design of outdoor spaces for social interaction.

The education of students regarding the natural factors which influence the form and kind of development of use areas.

To introduce the students to the principles of land planning at all scales of development.

The curriculum exposes the student to a wide range of environmental design problems related to the satisfaction of our social and physical needs. The program emphasizes the understanding of relationships between the natural and social systems and their manifestations in physical design form.

The Landscape Architecture program is fully accredited by the Landscape Architecture Accreditation Board of the American Society of Landscape Architects.

Curriculum Requirements	*Hours*
English Composition and Rhetoric (or conformity with University English requirements)	6
Arts and Humanities (Core A)	12
(A minimum of 6 hours in Art.)	
Social and Behavioral Sciences (Core B)	12
Natural Sciences (Core C)	12
(To include Inorganic Chemistry and Math. 3 and 4 or 14; Calculus may be substituted for the mathematics requirement.)	
General Physical Education	2
Engineering Sciences—(to include Surveying)	4
Selected Electives in Agriculture and Forestry	15
Elect courses in at least three areas listed: 1. Agricultural Economics/Resource Management/Agricultural Education; 2. Agricultural Mechanics; 3. Agronomy/Plant Sciences; 4. Forestry/Recreation and Parks; and 5. Horticulture. (Credits earned in Assigned Topics courses such as Res. M. 180 are not considered acceptable in meeting this requirement.)	
Courses in Landscape Architecture*	60
Electives	13
Total	136

*In addition each student will be required to work for at least one summer in an approved landscape architecture office, or equivalent.

Of the 60 hours required for a Bachelor of Science in Landscape Architecture, the following courses, or their equivalent, are required: L. Arc. 20, 21, 40, 41, 50, 51, 112, 131, 132, 140, 141, 150, 151, 250, 251, and 284.

Courses of Instruction

Resource Management (Res. M.)

1. *American Food and Agricultural Industry*. I. 3 hr. PR: Freshman standing or consent. Examination of the structure, function, and importance of the food and agricultural industry in the United States.

180. *Assigned Topics*. I, II. S. 1-4 hr. PR: In order to be eligible to register in Assigned Topics (Res. M. 180), the student must: (1) be in good standing, and (2) obtain approval of the Division of Resource Management before registration.

Agricultural Economics (Ag. Ec.)

(Economics 51 or 54 is required as a prerequisite for all courses in Agricultural Economics numbered 100 or above.)

10. *Agribusiness Accounting*. I. 4 hr. Accounting for business managers who do not intend to become accountants. (Students having prior college credit in accounting are not eligible for this course.) A brief coverage of terminology and methodology; decisions in accounting as directed by executives; interpretations and values from accounts and accounting statements.

104. *Farm Management.* I or II. 3 hr. The decision-making process; procedures for profit maximation; principles in assembling, analyzing, and using farm business records; the use of budgeting in evaluating alternatives.

195. *Senior Seminar, Agricultural Economics.* I. 1 hr. PR: Senior standing, major in resource management. A seminar to explore selected issues in agricultural economics for seniors majoring in resource management. The seminar is oriented to the consideration of current economic issues, potential employment responsibilities, and advanced study opportunities.

200. *Land Economics.* II. 3 hr. Classification, development, tenure, use, conservation, valuation, and taxation of rural, urban, mineral, forest, water, and recreational land resources. Private and public rights in land and the effect of population on the demand for land.

206. *Farm Planning.* I. 3 hr. PR: Ag. Ec. 104 or consent. Planning use of labor, soil, crops, livestock, buildings, and equipment; principal factors influencing returns on farms. *(Farm visits required.)*

211. *Rural Economic Development.* I or II. 3 hr. Resource utilization, economic behavior and economic systems and subsystems, trade, public revenue and its allocation, distribution of income, manpower problems, development policies, and regionalization in rural areas.

231. *Marketing Agricultural Products.* I or II. 3 hr. Market organization, policies, practices, and factors affecting the marketing of agricultural products. *(Tour of market agencies and facilities required.)*

235. *Marketing Dairy Products.* II. 2 hr. Milk-marketing policies and practices, including milk-market orders. *(Offered in Spring of odd years.)*

240. *Agricultural Prices.* I. 3 hr. Analysis of price-making forces which operate in the market places for the major agricultural commodities.

261. *Agribusiness Finance.* II. 3 hr. Credit needs for agricultural businesses, financing farm and market-agency firms, and organization and operation of credit agencies which finance agricultural business firms.

271. *Agricultural Policy.* II. 3 hr. Examination of economic aspects of governmental price programs, production and marketing controls, subsidies, parity, export and import policies, and other programs affecting agriculture.

330. *Cooperative Organization.* II. 3 hr. Organization, functions, and contributions of cooperatives in an economic system.

342. *International Agricultural Economic Development.* I. 3 hr. Current problems, theories, policies and strategies in planning for agricultural and rural development for increased food production and to improve the well-being of rural people in the developing countries of the world.

355. *Resource Analysis.* I. 3 hr. PR: Senior standing. Construction of models consistent with economic reality for allocating the factors of production available on farms, in forests, and in non-farm agricultural businesses to produce maximizing plans through use of linear and dynamic programming and electronic equipment.

Agricultural Education (Ag. Ed.)

160. *Materials for and Method of High School Teaching of Vocational Agriculture.* I. 3 hr. PR: Consent. Organization and preparation for teaching vocational agriculture in and through the high school. *(Also listed as C&I 160.)*

162. *Group Organization and Leadership.* I. 2 hr. PR: Consent. Principles and techniques involved in forming, structuring, developing, and directing organizations for effective professional leadership.

188. *Student Teaching*. I, II. 8 hr. PR: C&I 7, Ed. P. 105 and 106. *(See C&I 188 requirements.)*

260. *Principles of Cooperative Extension*. I. 2 hr. PR: Consent. Background, philosophy, and history of cooperative extension. Activities of county cooperative extension agents and cooperative extension programs in West Virginia. *(Offered in Fall of even years.)*

261. *Methods and Materials in Extension Education*. II. 2 hr. PR: Consent. Organization and preparation for extension teaching and the processes of communication. *(Offered in Spring of odd years.)*

263. *Teaching Young, Adult Farmer, and Off-Farm Agricultural Occupations Classes*. I. 2 hr. PR: Ed. P. 105, 106 or consent. Participation in conducting young farmer, adult farmer, and off-farm agricultural occupations classes; organization, course of study, method in teaching, and supervision of classes, young farmers' associations, adult farmers' organizations, and off-farm agricultural occupations organizations. *(Also listed as C&I 263.)*

264. *Cooperative Vocational Education*. II. 4 hr. PR: Consent. Preparation for planning, organizing, and conducting high school programs of cooperative vocational education, and familiarization with business organization and operation. *(Also listed as C&I 264.)*

362. *Program Building in Cooperative Extension*. II. 3 hr. PR: Consent. Organization in relation to program building. Leadership and group action. Overall working and educational objectives, principles, method, and goals in developing county extension programs. *(Offered in Spring of even years.)*

364. *Organizing and Directing Supervised Farming and Supervised Occupational Experience Programs*. S. 2 hr. PR: Ag. Ed. 160 or consent. Planning programs of supervised farming and supervised occupational experience, supervising, and evaluating such programs for day students, young farmers, adult farmer, and off-farm occupations classes and groups. *(Also listed as C&I 364.)*

Agricultural Mechanics (Ag. M.)

10. *Principles of Agricultural Mechanics*. I. 3 hr. A study of the development of mechanized production and processing together with the impact of such mechanization on environment, utilization of natural and renewable resources, pollution, and their effect on ecology. 3 hr. rec.

152. *Shop Theory and Methods*. I, II. 4 hr. Six areas of basic shop work: carpentry, cold metal work (forge, electric and gas welding), sheet metal (soldering, forming, cutting, riveting), tool care, and plumbing. 1 hr. rec., 6 hr. lab.

253. *Advanced Farm Machinery*. I. 3 hr. Systems approach to selection, use, and operation of machinery as related to agriculture, forestry, and other rural activities. Emphasis on safety and environmental impact. Use of records for management decisions, purchase, replacement, sale or overhaul. 2 hr. rec., 3 hr. lab.

259. *Farm Structures*. II. 3 hr. Study of structures required for agriculture, family housing, storage, and recreation. Includes function, planning, layout, materials, construction techniques, prefabrication, repair, remodeling, and costs. 2 hr. rec., 3 hr. lab.

270. *Electricity in Agriculture*. II. 3 hr. Study of production and safe use of electricity for home and agriculture. Emphasis on approved wiring practices, motors, and electrical controls and their applications in lighting, heating, refrigeration, air conditioning, water supply, and processing. 2 hr. rec., 3 hr. lab.

275. *Agricultural Engines*. II. 3 hr. Study of power sources (gasoline, diesel, turbine, wankel, etc.) for agriculture and forestry. Operation, selection, maintenance techniques, and emissions impact on power and fuel efficiency. 2 hr. rec., 3 hr. lab.

352. *Advanced Farm Mechanics.* S. 3 hr. PR: Agr. M. 152. Development of advanced skills with hand and power tools. Areas of emphasis dependent upon needs of individual students. Care and maintenance of power tools and shop organization and planning are essential parts of this course. 1 hr. rec., 6 hr. lab. *(Offered Summer of every third year—next offering 1984.)*

Landscape Architecture (L. Arc.)

5. *Introduction to Landscape Architecture.* I or II. 1 hr. *(Open to all WVU students.)*

20. *Landscape Architectural Drafting 1.* I. 3 hr. *(For Landscape Architecture majors only.)* Introduction to landscape architectural drafting.

21. *Landscape Architectural Graphics 2.* II. 3 hr. *(For Landscape Architecture majors only.)* PR: L. Arc. 20 or equiv. Introduction to various media and techniques for landscape architectural graphic presentation in two- and three-dimensional expression.

40. *Woody Landscape Plants 1.* I. 3 hr. PR: Pl. Sc. 52 or equiv. Laboratory and field study of deciduous ornamental woody plants and their suitability for landscape compositions.

41. *Woody Landscape Plants 2.* II. 3 hr. PR: L. Arc. 40 or consent. Laboratory and field study of evergreen ornamental woody plants and their suitability for landscape compositions.

50. *Theory of Landscape Arthitectural Design.* I. 3 hr. PR: L. Arc. 21 or equiv. Application of elements and principles of art and design to landscape architecture.

51. *Landscape Architectural Design.* II. 3 hr. PR: L. Arc. 50 or equiv. Investigation and application of various design factors which play a role in design and natural and man-made environment.

112. *History of Landscape Architecture.* I. 3 hr. PR: Consent. A broad survey of the history of the designed environment with emphasis on the development of landscape architecture.

131. *Landscape Architectural Construction 1.* I. 4 hr. PR: C.E. 1 or 5 equiv., Math. 3 and 4 or 14 or equiv. The study of the technical principles of grading design, their application to site planning, and preparation of land form grading plans.

132. *Landscape Architectural Construction 2.* II. 4 hr. PR: L. Arc. 131. Study and preparation of parkway plans (road alignment), surface and sub-surface drainage plans, advanced grading plans, and cost estimates.

140. *Planting Design 1.* I. 3 hr. PR: L. Arc. 40 and 41 or equiv. The use of plants in design with emphasis upon ecological and aesthetic applications.

141. *Planting Design 2.* II. 3 hr. PR: L. Arc. 140 and Agron. 2 or 10. Continuation of L. Arc. 140 with special emphasis on planting techniques, planting and seeding specifications, and landscape materials for implementing the design.

150. *Landscape Architectural Design 1.* I. 5 hr. PR: L. Arc. 51. Design problems involving private, semi-public and public areas with emphasis on site analysis, details, and presentation. Site design problems are integrated with landscape architectural construction and planting design courses.

151. *Landscape Architectural Design 2.* II. 5 hr. PR: L. Arc. 150.

229. *Landscape Architecture.* I. 3 hr. *(For non-Landscape Architecture majors only.)* An appreciation of the basic principles of design and information pertaining to the use of ornamental plants around the home.

248. *Design Analysis.* II. 2 hr. PR: Consent. Analysis of planning and design projects to offer solutions to a given problem. *(Offered in Spring of odd years.)*

250. *Advanced Landscape Architectural Design 1.* I. 6 hr. PR: L. Arc. 132 and 151. Advanced landscape design of semi-public and public areas involving comprehensive problems and in-depth individual and team study.

251. *Advanced Landscape Architectural Design 2.* II. 6 hr. PR: L. Arc. 250. Continuation of L. Arc. 250, culminating in a comprehensive final design project.

265. *Regional Design.* II. 3 hr. PR: Consent. Consideration of regional landscapes in order to effectively relate design to the ecology and development of a region. *(Offered in Spring of odd years.)*

276. *Recreation Planning.* I, II. *(I—Landscape Architecture majors only; II—Non-majors only.)* 3 hr. PR: Consent. Design of park and recreation areas involving park history, classification theory, and administration.

284. *Professional Practice.* II. 3 hr. PR: Consent. Procedures in preparation of contract documents, fees, estimates, operation of an office, and relationship to clients and contractors.

College of Arts and Sciences

Stanley Wearden, Ph.D. (Cornell U.), *Interim Dean of the College; Professor of Statistics.*
Charles W. Connell, Ph.D. (Rutgers U.), *Associate Dean; Associate Professor of History.*
Nicholas G. Evans, Ed.D. (WVU), *Assistant Dean; Assistant Professor of English.*

The primary mission of the College of Arts and Sciences is to promote the full development of the student as an individual and as a member of society. Students earning degrees in Arts and Sciences fulfill certain broad basic-education requirements and study at least one subject in some depth; in addition, they have an opportunity to incorporate a number of electives into their programs of study. The degree requirements in Arts and Sciences are, in part, intended to carry forward what is usually termed "a general education," thus providing a foundation for continued growth and development after graduation.

Ideally, the student should develop intellectually, spiritually, physically, and emotionally. The goal of such development should be an inner balance or stability on the basis of which further growth can take place. The student should develop the capacity for intellectual participation as a citizen in the community, state, country, and world. A general education should, therefore, provide for all students an experience appropriate both to individual self-understanding and the social needs which all people have in common.

Clearly, one purpose of a college education is to help students acquire knowledge and skills both for self-fulfillment and in preparation for the roles they will subsequently play in society. A less obvious but equally important purpose is to impart certain attitudes to students. In the interest of fulfilling both purposes, the College of Arts and Sciences strives to help students acquire the specific attributes listed below:

Knowledge

1. A knowledge of the main principles, facts, concepts, and theories in one's major area of concentration.

2. A knowledge of Western and non-Western civilizations: their distinctive characters (belief systems, languages, intellectual and artistic contributions), and their origins, development, and present states.

3. A knowledge and appreciation of the environment in which one operates (physical, biotic, social, technological, aesthetic), including knowledge of change processes (evolutionary, technological, social, intellectual) and knowledge of past adaptations as a basis for predicting the consequences of contemporary actions and changes.

4. A knowledge and appreciation of the arts, of their humanizing and energizing effects, and of one's connection with the arts through one's impulses toward creativity.

5. Acquaintance with the various technical languages (statistics, linguistics, etc.) that are increasingly necessary to understand the major approaches in the sciences and humanities.

Skills

1. Skills in the sophisticated techniques of one's major area of concentration, sufficient for the individual to use that skill with respect for quality of endeavor, imagination, creativity and social responsibility.

2. Skills in communication using a variety of channels including writing, speaking, reading, listening, and viewing.

3. Skills in analyzing and solving problems by recognizing ambiguities, using proper logic, marshalling pertinent facts and arguments, and using mathematicial techniques where appropriate.

4. Skills in the use of the imaginative and synthetic process of mind, including innovative thinking and recognition of the connections among a variety of intellectual frameworks and matrices.

5. Skills involved in decision-making, including the ability to recognize alternatives, project consequences, and assume the responsibility for making decisions.

Attitudes

1. An attitude of dispassionate self-appraisal, based upon an understanding of one's own nature and characterized by an awareness of one's own strengths and weaknesses.

2. An attitude of open-mindedness, permitting one to see beyond the limits of one's own occupation, economic status, language, and culture, and including a respect for opinions different from one's own.

3. A willingness to recognize and respect ethical obligations and the rights of others.

4. A committment to truth-seeking characterized by objectivity, utilization of evidence, intellectual curiosity, and the search for wisdom.

Enrollment

Three classes of students enroll in the College of Arts and Sciences: students working toward a degree in the College of Arts and Sciences; those pursuing a preprofessional curriculum in anticipation of earning a bachelor's degree in a professional school; and special students who are not degree candidates.

Admission to or completion of a preprofessional curriculum does not constitute admission to a professional school at WVU. (See "Admission to Medical Center Programs," page 14, and the appropriate *Undergraduate Catalog* or *Medical Center Catalog* sections describing admission to the professional school in question.)

Students who have earned fewer than 58 hours of credit and have not entered a degree program are classified as lower-division students in the College. During the semester in which they will complete 58 or more hours of course work, students in the College of Arts and Sciences should apply for

admission to degree programs in the college or department in which they intend to earn their degree. In the case of interdepartmental degree programs, applications should be made to the Chairperson of the Interdepartmental Major Committee. If a student has not been admitted to a degree program by the time of completion of 70 hours of course work, the student will not be permitted to re-enroll in the College of Arts and Sciences.

NOTE: Minimum and Maximum Load. A minimum of 12 hours in a semester is required for full-time status in the College of Arts and Sciences. No student enrolled in the College of Arts and Sciences may enroll for more than 19 hours in a semester without permission from the Committee on Academic Standards.

Admission to Arts and Sciences Degree Programs

Minimal College of Arts and Sciences requirements for regular admission into degree programs are completion of 58 hours of course credit, a 2.0 overall average, and a 2.0 average in courses already completed in the discipline of the degree program to which the student is applying. Specific degree programs may have additional requirements.

Students may be admitted to degree programs in the College of Arts and Sciences in two distinct categories:

1. *Regular Admission.* Student has met all College of Arts and Sciences and degree program requirements.

2. *Provisional Admission.* Student has completed 58 hours but has not yet met all College of Arts and Sciences and/or degree program requirements for entrance into the specific program. It should be stated in writing, by the department offering the degree program, the provisional terms under which the student is accepted, making clear the deficiencies the student must remove and the date by which such removal must be accomplished. Failure on the part of the student to remove deficiencies by the stipulated date will result in suspension from the degree program.

Students planning to qualify for teacher certification as well as for an Arts and Sciences degree should check with their advisers and the *Catalog* statement (College of Human Resources and Education) to determine the requirements for such certification.

Complete information concerning WVU admissions, registration, fees and expenses, and regulations may be found in Part 2 of the *Undergraduate Catalog.*

Admission to Degree Programs in Colleges and Schools Other Than the College of Arts and Sciences

Students planning to apply for admission to degree programs in other WVU colleges and schools should check the *Catalog* statements of those schools to determine the specific admission requirements. Students who have not been admitted into another college or school by the time they have earned 70 hours of credit cannot re-enroll in the College of Arts and Sciences unless they have been admitted into a degree program in the College of Arts and Sciences.

Degree Programs

The following degree programs are offered:

Biology	Geography	Physics
Chemistry	Geology	Political Science
Computer Science	History	Psychology
Economics	Interdepartmental Major	Sociology and Anthropology
English	Mathematics	Speech Communication
Foreign Languages	Philosophy	Statistics

Although some degree programs, for example, optometry, are not offered by WVU, students may initiate degree programs under the auspices of the Academic Common Market (see page 12). Normally, students would enroll for their first year or more at WVU and establish an academic record, and then submit application for transfer to the out-of-state institution. Additional information is available at the Academic Advising Center.

Board of Regents Bachelor of Arts Degree

Especially designed for the adult, the Board of Regents Bachelor of Arts Degree offers students the opportunity to gain credits for work and life experience (college equivalent credit).

Degree Requirements—Total credits: 128; Upper-Division credits: 40; General Education: 36, including: Communications: 6; Humanities: 6; Natural Sciences: 6; Social Sciences: 6.

Admission—Admission requirements are the same as for other WVU degree programs except students are not eligible for admission until four years after graduation from high school.

Fees—Tuition and fees are the same for the Regents B.A. Program as for other WVU degree programs except for the evaluation fee for life and work experiential learning assessment.

Detailed information is available from: Coordinator, Board of Regents B.A. Degree Program, WVU Student Services Center.

Interdepartmental Majors

Interdepartmental major programs involve concentrated study in more than one department in the College of Arts and Sciences of the University. These programs, which lead to the Bachelor of Arts degree, are of three kinds: Individualized Major Program; Specially Designated Area Programs; and Liberal Arts Major.

Individualized Major Program

The individualized major provides the undergraduate student an opportunity to arrange an individually tailored program when the educational aims of the student fall between established department boundaries. Ideally, the proposal should be developed during the sophomore year since a student normally would be expected to embark on this program at the beginning of the junior year. A major typically involves only two academic departments—one of which must be in the College of Arts and Sciences—and the program should be planned so that the student attains academic depth at least matching the depth and rigor of a traditional departmental major.

Students considering the Individualized Major Program are encouraged to approach the chairperson of the Individualized Major Committee of the

College of Arts and Sciences with program ideas or questions before submitting a formal proposal. Following the initial discussion, students are advised to seek counsel with individual faculty who may thereafter agree to become part of a faculty advisory committee. When initial discussion and consultation are completed, students are encouraged to submit the formal proposal for acceptance into the program. The proposal is submitted first to the student's advisory committee, then to the Individualized Major Committee, and should include: (1) a definition of the area of concentration; (2) a statement of the objectives served by the program; (3) a listing of courses that will constitute the program; and (4) a brief personal intellectual biography. Additional information about the formal proposal is available at the Academic Advising Center.

Specially Designated Area Programs

Appalachian Studies

The interdepartmental major in Appalachian Studies is designed to allow students to understand the growing body of knowledge about the problems and culture of the Appalachian region. WVU is uniquely equipped to provide a program of outstanding quality since the WVU Library has been collecting Appalachian materials for many years with the result that nationally recognized experts on various aspects of Appalachian culture are in permanent residence on campus.

Because the Appalachian Studies major is a new conception, it is perhaps advisable for a student to take a double major in the College, having, for example, a major in history and a major in Appalachian Studies or even, as is also possible, a major in two different colleges, thus having a major in social work, for example, and Appalachian Studies.

The general procedure for admission to the program is as follows: (1) the student will contact the chairperson of the Appalachian Studies Advisory Committee for information and guidance in making an application and in drawing up a program of study; (2) the chairperson or other designated member of the Advisory Committee will be the student's major adviser and will sign the student's schedule forms each semester; (3) upon completion of the program and all other College and University requirements, the student will be awarded the degree of Bachelor of Arts from the College of Arts and Sciences.

Art History

The interdepartmental major in the Art History is designed to give an interdisciplinary approach to the study of objects of art, how they are made, the ways in which they are used, and the civilizations and modes of thought which produce them—a range from the concrete to the metaphysical. This program provides a systematic foundation in the history of the art of the Western world. Requirements in art history and studio art are offered in the College of Creative Arts, and those in history, anthropology, and language in the College of Arts and Sciences. Students are encouraged to add a broad background, according to interest, from selected courses in several areas including art, business and economics, English, foreign languages, history, humanities, journalism, library science, music, philosophy, public administration, religious studies, sociology and anthropology, and theatre. A senior research project, on an approved subject selected by the student, is completed during the last semester.

Comparative Literature

The Comparative Literature major studies literature in its many aspects without national and linguistic boundaries. The program is designed for those students who wish to explore the languages and literatures of at least two cultures and provides for those students a liberal education based on a comparative study of literary masterpieces and their relationship to history, philosophy, and the fine arts. The curriculum seeks to develop a student's ability to read critically, to aid the student in gaining a more integrated sense of general literary history than is offered by the study of a single language, and to prepare the student to investigate problems involving more than one literature (for example, the study of themes and myths, genres and forms, movements and eras, literature and the other arts, literary theory and criticism).

The undergraduate degree is intended to provide a basis for the following areas of professional specialization: graduate study in comparative literature, English, or foreign language; teaching of literature or foreign language; government work, international relations, or business administration, particularly in those areas of government or business which require an extensive knowledge of foreign culture and the ability to communicate well in both English and a foreign language.

Requirements: A student must fulfill all University and College of Arts and Sciences degree requirements. A sample course of study for the undergraduate major in comparative literature follows:

Courses in the English Department: Required: English 125, 232; 1 language course (111, 113, 210, 211); 12 hours from among English 35/36, 21/22. 24/25. *Recommended:* Upper-division work in American, British, or world literature. Total hours required: 22.

Courses in the Foreign Languages Department: Required: 6 hours of advanced literature in the first foreign language; 12 hours from the following categories: second foreign language; additional language or literature courses in the first foreign language; literature in translation courses. Total hours required: 18.

The student is also required to take a one-hour seminar in methodology (directed study).

International Studies

The International Studies major is designed to provide a knowledge of global affairs, to help develop understanding and appreciation of other cultures and societies, and to promote informed analysis of world interdependence. It provides the basis for careers in many areas, e.g., international business and commerce, international administration and service, as well as government, law, and research.

Internships and Study Abroad. With prior approal by the International Studies Adviser, students may receive academic credit toward the degree for internships in Washington, D.C. and elsewhere and/or for study abroad.

Requirements. The major consists of three parts:

1. Introductory Core (15 hours)—Majors are required to take Economics 54 and 55 and three more courses from the following: Geography 1, 7, 8; History 2, 4, 5, 6; Humanities 5; Multidisciplinary Studies 90; Political Science 3; Sociology and Anthropology 5, 51.

2. Advanced Core (12 hours)—Majors are required to take four courses from the following: Economics 110, 250; Geography 202; Political Science 160, 50.

3. Area of Concentration (24 hours)—Students select an Area of Concentration for specialization (Africa and the Middle East, East Asia, East Europe, West Europe, Latin America, or a topic, such as Development Studies). Students take a variety of courses in economics, foreign languages, geography, history, music, philosophy, political science, religious studies, sociology and anthropology, and technology education.

Medieval and Renaissance Studies

This interdepartmental major is designed to provide a broad liberal arts background while permitting the student to achieve a fuller understanding of the culture of this period in which were developed many of the enduring social, political, religious, artistic, and literary traditions of Western civilization.

By selecting a primary area of concentration of 15 upper-division hours and two secondary areas of 9 upper-division hours each from the fields of English, foreign languages, history, or the arts, the student is required to examine medieval and Renaissance culture from a variety of perspectives. Six hours of Latin must also be completed for this major. With careful selection of courses, this program may be combined with a traditional departmental major.

Musical Arts

The interdepartmental program in Musical Arts, which is offered cooperatively with the College of Creative Arts, is intended for the student with an interest in music who wishes to pursue a broad liberal arts education, rather than seek a professional career as a performer, composer, or teacher. Depending upon individual interests, students may choose elective courses which could also provide a basis for careers in music librarianship, computer science, music merchandising, arts management, or music criticism.

Students wishing to enter this program must have the approval of the program adviser and must meet audition requirements in a principal performance area, which can be piano, organ, voice, or band or orchestra instrument.

Additional details may be found on pages 249-251 of this *Catalog*.

Religious Studies

The interdepartmental degree program in Religious Studies, designed for any student who wishes to take a liberal arts degree, offers a basic general liberal arts education for students who expect to enter such professions as law, medicine, and business, provided electives were judiciously chosen in the area of one's narrower later specialization. This major would be useful to anyone who hopes to embark upon a professional career in religion, e.g., the ministry, academic study of theology or biblical studies, religious journalism, teaching in the area of religion, etc.

The student should be aware of the large amount of discretion offered by this degree program in the area of elective work. It would even be possible for a student, by planning carefully, to arrange a double major in another subject while undertaking the interdepartmental major in Religious Studies.

Many interdisciplinary combinations are possible to suit the goals of many different students. Combinations are both possible and desirable in the areas of religious studies and journalism, social work, speech communication, education, anthropology, and many other areas.

Liberal Arts Major

The program of study leading to a degree of Bachelor of Arts with an interdepartmental major in Liberal Arts is a four-year curriculum offering the student an opportunity to develop a critical understanding of the major fields of human knowledge and their interrelationships. Its primary concern is with that part of a student's whole education which looks first of all to his/her life as a responsible human being and citizen. At the same time, the program does not ignore that part of higher education which looks to the development of competence in some special area of interest. Thus, the program is designed for the student to achieve two objectives: (1) to become a "liberally" educated person; and (2) to gain a specialized knowledge in an area or subject of particular interest.

With few exceptions, the basic College and University requirements and regulations apply to the liberal arts interdepartmental major. The particular requirements of the major call for a balanced distribution of 80 to 90 credit hours among courses in the humanities, the social sciences, and mathematics and science. Selection of specific courses is worked out in conference between the student and the faculty adviser.

Although the program does not require the student to identify a single academic discipline as a major, there is sufficient flexibility in the curriculum to permit a student with strong academic interests and career goals to concentrate study in one area of interest to an extent that comes close to equaling a major in a single academic discipline. Students considering enrollment in this program should discuss their interests with the liberal arts adviser before making a decision.

Any student is eligible to apply for admission to the interdepartmental major program. Ideally, the student should seek admission to the program during the sophomore year; however, any student may consider adoption of the program at any point in the academic career provided the requirements of the program, the College of Arts and Sciences, and the University can still be met. Additional information is available through the Academic Advising Center.

Program in the History of Science and Technology

The College of Arts and Sciences and the Department of History at WVU have established a curriculum in the History of Science and Technology to stimulate the development of a more comprehensive and integrated approach to liberal education and to encourage wider use of the intellectual and technical resources available within the University. At the undergraduate level, there are introductory and upper-division courses in the history of science and technology.

Women's Studies Program

The WVU Women's Studies Program was established in 1980 as an interdisciplinary program within the College of Arts and Sciences, serving the entire University.

The basic premise of the Women's Studies Program is that the study of women is fundamental to our knowledge of humankind and that the inclusion of women's experiences and achievements in the curriculum is central to a liberal arts education. In support of this premise, the program stimulates, facilitates, and coordinates teaching and research on past and present realities and assumptions about women and men in society and culture.

Each semester, a list of recommended courses and independent study opportunities is available from the Women's Studies office. Interested students may enroll in "Introduction to Women's Studies" (MDS 40), as well as in courses throughout the University which are concerned with women and/or gender-related issues. There are also possibilites for individualized interdisciplinary degree programs. Such programs are coordinated through the Office of the Dean, College of Arts and Sciences; preliminary information is available from the Women's Studies Coordinator.

Credit by Examination

Credit by Examination provides students the opportunity to challenge courses in order to verify that they have acquired sufficient knowledge to earn credit without further study in the classroom. This opportunity to challenge a course does not include the opportunity to further instruction and/or tutoring by an instructor.

Any student may petition to receive Credit by Examination for any course listed by a department in the College of Arts and Sciences as one for which credit by examination is appropriately awarded. Applications, course lists, and examination schedules are available each semester at the Academic Advising Center of the College of Arts and Sciences.

A student may apply to challenge a course for Credit by Examination if: (a) the student is at the time of examination registered in the University; (b) the student's official record does not show credit for the course (i.e., any grade of S, P, A, B, C, D, or I); (c) the student is not officially enrolled in the course at the time of examination (A student who withdraws from a course after the end of the official registration period is officially enrolled in that course until the end of the semester, and not eligible to take the course by examination during that semester.); and (d) a grade of F has not been recorded on the student's record for the course within two calendar years of the date of the examination. A student may challenge the same course by examination only two times.

Credit only (not a grade) will be awarded for the successful completion of the examination with a grade of C or higher. Because a comprehensive examination is used to establish credit, it is the policy of the college that a student should demonstrate at least an average (C) knowledge of course content to receive any credit. The criteria for earning a C are to be made known in advance to students who request the information from the department offering the course examination.

A nonrefundable fee is charged for credit by examination and must be paid within the prescribed period to each examination period.

Regulations Affecting Degrees

Application for Graduation and Diploma

All candidates for degrees in the College of Arts and Sciences must fill out an application for graduation and diploma at the Academic Advising Center. Candidates should make such application during the second semester of their junior year in order to have their records evaluated as to College of Arts and Sciences and University requirements. Application *must* be made during the first month of the semester or session in which the candidate expects to be graduated. If a student does not, for some reason, graduate on the date for which the student applied initially, the student must re-apply for a later date. No candidate can be graduated without application.

Bachelor of Arts Degree

The degree of Bachelor of Arts in the College of Arts and Sciences is conferred upon a student who complies with the general regulations of WVU concerning degrees and satisfies all entrance, college, and departmental requirements.

Bachelor of Science Degree

The degree of Bachelor of Science is conferred upon a student who complies with the general regulations of WVU concerning degrees, satisfies all entrance and college requirements, and completes the requirements for the Bachelor of Science degree in one of the following fields: Chemistry, Computer Science, Geology, Physics, and Statistics.

Requirements for Degrees

In order to qualify for graduation, students must fulfill the University requirements stipulated in Part 2 of the *Undergraduate Catalog*, as well as College of Arts and Sciences and degree program requirements:

College of Arts and Sciences Requirements

A. *Foreign Language:* Two years of study in one language. The student may satisfy this requirement by taking courses 1, 2, 3, and 4, or other approved courses, in one language. Students who present two or more units of high school credit in a foreign language may satisfy this requirement by taking courses 3 and 4, or other approved courses, in that language. Such students may elect to take courses 1 and/or 2 as additional preparation for courses 3 and 4. (For explanation of various options and other approved courses, see listings under "Foreign Languages" in the *Undergraduate Catalog*.) Courses used to fulfill this requirement are *in addition to* those used to fulfill the University Core A requirement.

B. *Mathematical Science:* Each student must satisfactorily complete a minimum of 3 semester hours in the mathematical sciences—mathematics, statistics, or computer science. Courses used to fulfill this requirement may simultaneously be used to fulfill the University Core C requirement.

C. *Laboratory Science:* Each student must satisfactorily complete at least one laboratory course in a Core C field *other than* mathematics, statistics, or computer science. The College of Arts and Sciences strongly recommends a full year in one science. Courses used to fulfill this requirement may simultaneously be used to fulfill the University Core C requirement.

D. *Fine Arts:* Each student must satisfactorily complete a minimum of 3 semester hours focused on the fine arts—art, literature, music, theatre, etc. Courses used to fulfill this requirement are *in addition to* those used to fulfill the University Core A requirement. A list of acceptable courses is available at the Academic Advising Center, the Office of the Dean, and from departmental advisers.

E. *International Studies or Minority Studies:* Each student must satisfactorily complete 3 semester hours of study of a foreign culture or civilization other than that of Modern Western Europe or Canada, or 3 semester hours of study of a minority culture in the United States or Canada. This requirement may be used simultaneously to satisfy core requirements, but no course used to satisfy the foreign language requirement may be used to fulfill this requirement. A list of acceptable courses is available at the Academic Advising Center, the Office of the Dean, and from departmental advisers.

F. *Electives:* As approved by the adviser, to complete the minimum number of hours required for graduation.

G. *Grade-Point Average:* A cumulative average of 2.0 is required for graduation.

Degree Program Requirements

A. *Major Subject:* Requirements are listed separately in the *Catalog* by department or degree program. To establish a major sequence and to qualify for graduation, the student must have spent at least two semesters and have accumulated a minimum of 30 semester hours as a student in a degree program.

B. *Transfer Credit:* Except with the approval of the department or degree program chairperson, no upper-division course in the major, taken at another institution, will be counted toward meeting the requirements of the degree program.

C. *Grade-Point Average:* Individual departments or degree programs may require a grade-point average of 2.0 (C) or higher in the major, or a grade of C or higher for certain specified required courses.

D. *Credit Hours:* A total of 128 hours is required for the Bachelor of Arts degree. The Bachelor of Science degree in Computer Science, Geology, and Statistics requires 134 hours; in Chemistry and Physics, 136 hours.

Credit Limitations

The following may *not* be counted toward the hours required for graduation:

A. Mathematics 2.

B. Courses in which the grade received is other than A, B, C, D, P, or S. Credit by examination, however, is counted toward hours required for graduation unless it was granted for courses otherwise excluded in this list.

C. Any course passed more than once, unless a course is designated as repeatable and is so described in the *Catalog*.

D. More than 42 hours in one departmental subject for a Bachelor of Arts degree. (In the case of English language and literature, the 42-hour maximum is exclusive of credits in English 1 and 2.) As much as 60 hours may be presented from a department that offers more than one subject (e.g., Foreign Languages).

E. More than 8 hours of first- and second-year Military Science (ROTC) or Air Force Aerospace Studies (ROTC) courses.

F. More than 6 hours of third- and fourth-year Military Science (ROTC) or Air Force Aerospace Studies (ROTC) courses.

G. More than 72 hours of transfer credit from accredited junior or community colleges.

H. More than 18 semester hours of credit for which only a grade of P is recorded. (See Pass-Fail Grading, pages 37-38.)

I. Any course in which the final grade is F. The student must take the course again *in residence at WVU* if the student desires to receive credit for it.

Preparation for the Study of Dentistry, Law, or Medicine

Some students preparing for the study of dentistry or medicine may satisfy the requirements for entrance into dental or medical school by majoring in any College of Arts and Sciences subject and including in their undergraduate course selections the following minimum requirements or their equivalents: general biology with laboratory (2 semesters); inorganic chemistry with laboratory (2 semesters); organic chemistry with laboratory

(2 semesters); introductory physics with laboratory (2 semesters); social or behavioral sciences (2 semesters), and English composition and rhetoric (2 semesters). These requirements overlap those of the University Core Curriculum, which must be satisfied by all students. All degree programs in the College of Arts and Sciences offer a major which accommodates the above courses. Some students are admitted to a school of dentistry or medicine after completing three years of undergraduate work. These students may earn the bachelor's degree by completing three years in the College of Arts and Sciences and one year in a dental or medical school, if, as in some cases, courses taken in the first year of dental or medical school may be credited to the degree program in the College of Arts and Sciences.

Admission to or completion of a preprofessional curriculum does not constitute admission to a professional school. (See "Admission to Medical Center Programs," page 14, and the appropriate *Catalog* sections describing admission to the professional school in question.)

No specific program of pre-law education is prescribed. Courses of study which demand intellectual self-discipline are encouraged. The ability to speak and write clearly, ordering thoughts intelligently, and using language accurately is highly desirable. Some background in accounting is helpful in understanding complex tax and corporate structure matters.

University Core Curriculum Courses

The following courses in the College of Arts and Sciences meet the University criteria to qualify for Core Curriculum credit:

Biology

All biology courses: Biol. 1-271—*Core C.*

Chemistry

All chemistry courses: Chem. 10-341—*Core C.*

Computer Science

All computer science courses, except those numbered C.S. 190-197, qualify for *Core C;* however, the only undergraduate computer science courses open to non-majors are C.S. 5 and C.S. 60.

Economics

Econ. 51, 54-55, 110, 130, 160, 200, 211-213, 216, 241, 245-246, 250, 255, 257, 262-263, 270, 279—*Core B.*

English

Engl. 21-22, 24-25, 35-36, 40, 45, 80, 85, 101-104, 106, 108, 111-113, 125, 130-134, 141, 143, 145, 150, 170-172, 175, 178, 180-181, 183, 186, 188, 191, 197, 201-202, 208, 210-211, 220, 223, 232-233, 235-236, 240-241, 245, 250, 255-256, 261-268, 280, 283, 288, 290, 294, 310-311, 330-332, 334-337, 340-341, 345, 350, 356, 365-366, 369-372, 392—*Core A.*

Foreign Languages

Chinese 191—*Core A.*

Classics 1-4, 11-14, 101-102, 109-110, 113, 165, 192—*Core A.*

Foreign Literature in Translation 111-112, 121-122, 131-132, 141-142, 151-152, 155, 161-162, 171, 181-182, 191-192—*Core A.*

French 1-4, 10-11, 21-24, 33-34, 101-104, 109-112, 115, 118—*Core A.*

German 1-4, 10-11, 23-24, 33-34, 103-104, 109-112, 121-122, 131, 191—*Core A.*

Hebrew 1-4, 191—*Core A.*

Italian 1-4, 109-110, 191—*Core A.*
Japanese 191—*Core A.*
Linguistics 1-3, 111—*Core A.*
Polish 1-2—*Core A.*
Portuguese 1-4—*Core A.*
Russian 1-4, 103-106, 109-110, 144-145—*Core A.*
Spanish 1-4, 10-11, 23-24, 33-34, 103-104, 109-110, 116-118, 121-122, 191—*Core A.*

Geology and Geography

Geol. 1-4, 7—*Core C.*
Geog. 1, 7-8, 105, 107, 109-110, 140-141, 143-145, 150, 200-202, 205, 209, 215, 235—*Core B.*

History

All history courses: Hist. 1-290—*Core B.*

Humanities

Humanities 1-5, 10-11, 191, 290—*Core A.*

Mathematics

All mathematics courses: Math. 3-292—*Core C.* (Note: Math. 2 **is not** a core course.)

Philosophy

All philosophy courses: Phil. 1-292—*Core A.*

Physical Science

Physical Science 1-2, 11-12—*Core C.*

Physics

All physics courses: Phys. 1-388—*Core C;* Astronomy 106, 216, 267—*Core C.*

Political Science

All political science courses: Pol. S. 1-279—*Core B.* (Note: Pol. S. 188-189, 191, 195-196, 200, 299-300, 310, 335-336, 345, 350-351, 355, 360, 370 **are not** core courses.)

Psychology

All psychology courses: Psych. 1-297—*Core B.*

Religious Studies

All religious studies courses: Relig. 5-491—*Core A.*

Sociology and Anthropology

Soc. & A. 1, 5, 51, 102, 121-123, 125, 131-133, 135-136, 138, 140, 145, 151, 153, 156-158, 160, 201-202, 204-205, 222, 232-233, 240, 255, 260-262—*Core B.*

Speech Communication

Spch. 11-14, 21, 80, 105-109, 111, 131, 133, 161, 180, 187, 191, 206, 221, 230-231—*Core A.*

Statistics

All statistics courses, except those numbered Stat. 190-197, qualify for *Core C.*

Courses of Instruction and Curricula

Orientation (Orien.)

1. *Orientation to University Life.* I, II. 1 hr. Open only to new students in their first semester at the University. Study of the values, orientation, and emphasis which characterize higher education and an explanation of the nature of a university and its role. *(Pass-Fail grading only.)*

51. *Career Series—Career Planning Exploration.* I, II. 1 hr. Exploration of careers with special emphasis on individual interests, abilities, and values. Most beneficial to freshmen and sophomores, but appropriate for juniors and seniors. *(Pass-Fail grading only.)*

52. *Career Series—Job Search.* I, II. 1 hr. PR: Orien. 51 recommended. Methods of looking for a job—employer expectations, interviewing, resumes, letter writing, etc. Should be taken next to last semester, but can be taken at other times. *(Pass-Fail grading only.)*

60. *Introduction to Health Careers.* II. 1 hr. A study of careers in the health professions. Readings, lectures, and discussions by professionals in many health fields will include the educational requirements for and functions of their respective health professions. *(Pass-Fail grading only.)*

120. *Leadership Development.* I. 2 hr. PR: Sophomore standing. Primarily for sophomores and juniors. A practical survey of leadership techniques taught by various instructors. Major emphasis placed upon improvement of leadership abilities within the WVU campus structure and problems particular to student organizations. *(Pass-Fail grading only.)*

150. *Orientation to Law.* I, II. 1 hr. An orientation to the legal profession for undergraduates. Undergraduate preparation for law school; Law School Admissions Test (LSAT); admission to law school, law school experience and the legal profession. *(Pass-Fail grading only.)*

191. *Orientation Practicum.* I, II. 1 hr. PR: Sophomore or higher standing and consent. Students will participate in Orien. 1 as assistants to faculty teaching Orien. 1. Practicum form of study leading to an understanding of the values, orientations, and emphases which characterize higher education. *(Pass-Fail grading only.)*

Appalachian Studies

See Interdepartmental Majors, page 89.

Biology

Faculty

Martin W. Schein, Sc.D. (J. Hopkins U.), *Chairperson and Centennial Professor of Biology.*
Robert D. Allen, Ph.D. (UCLA), *Associate Professor of Biology.*
Nelle P. Ammons, Ph.D. (U. Pitt), *Professor Emerita of Botany.*
Charles H. Baer, Ph.D. (U. Md.), *Professor Emeritus of Biology.*
Anthony J. Becker, Jr., Ph.D. (WVU), *Adjunct Assistant Professor of Biology.*
Herald D. Bennett, Ph.D. (U. Iowa), *Professor Emeritus of Biology.*
Arnold Benson, M.A. (U. Colo.), *Assistant Professor of Biology.*
David F. Blaydes, Ph.D. (Ind. U.), *Professor of Biology.*
Melvin L. Brown, Ph.D. (WVU), *Adjunct Professor of Biology.*
Roy L. Butcher, Ph.D. (Iowa St. U.), *Adjunct Professor of Biology.*

Roy B. Clarkson, Ph.D. (WVU), *Professor of Biology; Herbarium Curator; Associate Chairperson.*
Jesse F. Clovis, Ph.D. (Cornell U.), *Professor of Biology.*
William E. Collins, Ph.D. (U. Wisc.), *Professor of Biology; Vice-President, Academic Affairs and Research.*
Mullen O. Coover, M.S. (WVU), *Associate Professor of Biology; Undergraduate Adviser; Associate Chairperson.*
Earl L. Core, Ph.D. (Columbia U.), *Professor Emeritus of Biology.*
William V. Dashek, Ph.D. (Marquette U.), *Assistant Professor of Biology.*
John J. DeCosta, Ph.D. (Ind. U.), *Professor of Biology.*
Michael P. Donovan, Ph.D. (WVU), *Assistant Professor of Biology.*
Dorothy Covalt Dunning, Ph.D. (Tufts U.), *Associate Professor of Biology.*
Ramsey H. Frist, Ph.D. (U. Pitt), *Associate Professor of Biology.*
Lloyd R. Gribble, Ph.D. (WVU), *Professor Emeritus of Zoology.*
Roland B. Guthrie, Ph.D. (WVU), *Associate Professor of Biology; Arboretum Curator.*
John E. Hall, Ph.D. (Purdue U.), *Adjunct Professor of Biology.*
Willis H. Hertig, Jr., Ph.D. (WVU), *Associate Professor of Biology.*
E. C. Keller, Jr., Ph.D. (Penn St. U.), *Professor of Biology.*
Ray Koppelman, Ph.D. (U. Chicago), *Adjunct Professor of Biology.*
Gerald E. Lang, Ph.D. (Rutgers U.), *Associate Professor of Biology.*
Arthur H. Livermore, Ph.D., (U. Rochester), *Adjunct Professor of Biology.*
Joseph A. Marshall, Ph.D. (U. Md.), *Associate Professor of Biology.*
James B. McGraw, Ph.D. (Duke U.), *Visiting Assistant Professor of Biology.*
Ethel C. Montiegel, M.S. (WVU), *Associate Professor of Biology.*
Charles G. Oliver, Ph.D. (Oxford U.), *Adjunct Assistant Professor of Biology.*
Dennis C. Quinlan, Ph.D. (U. Rochester), *Associate Professor of Biology.*
Steven L. Stephenson, Ph.D. (VPI & SU), *Adjunct Associate Professor of Biology.*
Richard P. Sutter, Ph.D. (Tufts U.), *Professor of Biology.*
Leland H. Taylor, Sc.D. (Harvard U.), *Professor Emeritus of Zoology.*
Robert H. Waldman, M.D. (Wash. U.), *Adjunct Professor of Biology.*
Stanley Wearden, Ph.D. (Cornell U.), *Adjunct Professor of Biology; Interim Dean, College of Arts and Sciences.*
Robert C. Whitmore, Ph.D. (BYU), *Adjunct Associate Professor of Biology.*
Leah A. Williams, Ph.D. (WVU), *Associate Professor of Biology.*

Programs

The Bachelor of Arts degree with a major in Biology is designed to prepare students for professional careers in the life sciences by way of several options. The required courses of the options provide preparation for graduate study in many of the specialized biological disciplines, for professional study in medicine, dentistry, or other health-related sciences, for secondary school teaching, or for technical careers in government and private industry. The options are: (1) General Biology—the standard program; (2) Environmental Science Technician; (3) Laboratory Science Technician; (4) Natural Science Technician; (5) Marine Science; and (6) Biobusiness.

Off-campus field experience in various aspects of marine biology is available in the summer at Wallops Island (Va.) Marine Station. Information regarding the program may be obtained by contacting the Chairperson, Department of Biology.

Major in Biology

Admission to the degree program requires at least a cumulative average of 2.0 for courses in biology. Upon admission to the degree program (58 hours completed), the student may select any one of the program options. Some movement between options is possible, but the student must work closely with an adviser to insure completion of requirements in at least one option. The first two years of study are the same for all options; all, except the Natural

Science option, satisfy requirements for admission to graduate and professional schools. (The Natural Science option lacks the 8 hours of physics required by most graduate and professional schools.) Students must maintain at least a 2.0 cumulative average for biology courses at WVU in order to retain status as a biology major.

Minimum requirements for graduation with a degree in biology are 31 hours of biology courses. (*Note:* A maximum of 42 hours in biology may be counted towards meeting graduation requirements.) Biology electives must be selected from courses listed under Courses of Instruction in Biology; at least one of these electives must be a laboratory course. With the adviser's approval, courses in the College of Agriculture and Forestry and the School of Medicine may be selected to satisfy the elective requirement. The student should consult with the adviser in choosing biology electives and those general electives which satisfy both University and College of Arts and Sciences requirements.

Biology 209 may be repeated for up to 6 hours of credit but cannot be used as department elective hours.

Requirements for each of the programs options are:

Courses Basic to All Options

Biol. 1, 2, 101, 102, 103, 104—(24 hr.)

Chem. 15, 16, 133, 134, 135, 136—(16 hr.)

Math. 14 *or* 3 and 4 (may be waived on the basis of ACT test scores)—(4 or 6 hr.)

Math. 15 and 16 *or* Math. 128 *and* either statistics or computer science; Econ. 125 may be substituted for Stat. 101 in the Biobusiness option.—(8 or 6 hr.)

In addition to the above, the following are specific requirements in each of the options.

General Biology (Standard) Option

Phys. 1, 2—(8 hr.)

Biology electives—(7 or 8 hr.)

Environmental Science Technician Option

Phys. 1, 2—(8 hr.)

Biol. 217—(3 hr.)

Geology or Soils courses—(8 hr.)

Stat. 201—(3 hr.)

Students in this option may prepare themselves for future entry into the M.S.E. graduate program in the environmental area of Civil Engineering. Students planning for this work should take as many of the following courses as possible during their undergraduate programs: Math. 15, 16, 17, 18; M.E. 41; C.E. 120, 146, and 147. C.E. 147 should be given first priority.

Laboratory Science Technician Option

Phys. 1, 2—(8 hr.)

Biol. 216—(3 hr.)

Chem. 115, 141 and 142—(8 hr.)

Ag. Bi. 210—(3 hr.)

Marine Science Option

Phys. 1, 2—(8 hr.)
Biol. 255—(4 hr.)
Elective courses in Marine Sciences (usually taken during the summer at a marine biology station)—(9 hr.)

Natural Science Technician Option

Biol. 51, 151, 255—(10 hr.)
Summer field experience or equivalent courses at a field station—(6 hr.)

Biobusiness Option

Phys. 1, 2—(8 hr.)
Econ. 54, 55—(6 hr.)
Biology electives—(7 or 8 hr.)
Business electives—(18 hr.)

Honors Program

To be eligible for admission to the Departmental Honors Program, a student must have a 3.4 overall average, and must have the approval of the departmental honors faculty. Qualified students should consult their advisers about admission to the program.

Individual original research, a senior thesis, and seminar are a required part of the program.

Courses of Instruction in Biology (Biol.)

1. *General Biology*. I, II, S. 4 hr. Introductory course in biology: genetic, ecology, behavioral, developmental, and contemporary aspects of biology.

2. *General Biology*. I, II, S. 4 hr. Introductory course in biology: cellular, physiological, regulatory, taxonomic aspects of biology.

51. *Dendrology (Angiosperms)*. I. 3 hr. *(Primarily for forestry students.)* Classification, identification, and distribution of angiosperm trees and shrubs of North America.

52. *Dendrology (Gymnosperms)*. II. 1 hr. *(Primarily for forestry students.)* Classification, identification, and distribution of gymnosperm trees and shrubs of North America.

101. *Biology of Organisms 1*. I. 4 hr. PR: Biol. 1 and 2 or equiv. Adaptations of individual organisms, both plant and animal, to their environments are studied from an evolutionary perspective. Processes mediating these adaptations include reproduction, development, systematics, physiology and control mechanisms. Evidence evaluation stressed.

102. *Biology of Organisms 2*. II. 4 hr. PR: Biol. 1 and 2 or equiv. A continuation of Biol. 101. Adaptations of individual organisms, both plant and animal, to their environment and the processes mediating these adaptations are discussed from an evolutionary perspective. Evidence evaluation is stressed.

103. *Population Biology*. I. 4 hr. PR: Biol. 1 and 2, Math 4, or consent. Biological populations and their environmental relationships.

104. *Cellular and Molecular Biology*. II. 4 hr. PR: Biol. 1 and 2, general physics, organic chemistry, or consent. A study of cell structure and function beginning at the molecular level of organization and proceeding through different levels of complexity.

107. *Honors Investigation and Thesis.* I, II, S. 1-4 hr. (May be repeated for credit; max. credit 12 hr.) PR: Second semester of junior year, recommendation of adviser; biology majors only. Supervised readings, investigation, and study.

109. *Topics and Problems in Biology.* I, II, S. 1-4 hr. PR: Consent. Topics and problems in contemporary biology. All topics and problems must be selected in consultation with the instructor.

151. *Plant Systematics.* II. 4 hr. Classification, ecology, and identifications of local vascular plants.

152. *The Plant Kingdom.* I, S. 4 hr. PR: Biol. 1 and 2 or equiv. *(Not open to students having credit for Biol. 351, 352.)* Study of the evolution, structure, and development of plants beginning with simple plants and proceeding through various levels of complexity to the flowering plants. *(Offered in odd years.)*

166. *Human Physiology.* II. 3 hr. PR: Biol. 1 and 2 or consent. *(Intended for non-Biology majors.)* An introductory course in the function of the human.

169. *Plant Physiology.* II. 3 hr. PR: Chem. 15 and 16, or equiv. Physiochemical processes of plants.

201. *History of Biology.* I. 3 hr. PR: Biol. 1 and 2 or equiv. History of development of biological knowledge, with philosophical and social backgrounds.

209. *Topics and Problems in Biology.* I, II, S. 1-4 hr. PR: Consent. Topics and problems in contemporary biology. All topics or problems must be selected in consultation with the instructor.

211. *Advanced Cellular and Molecular Biology.* I. 4 hr. PR: Biol. 104. Advanced study of fundamental cellular activities and their underlying molecular processes.

215. *Cytology.* II. 4 hr. PR: Biol. 1 and 2 or equiv. Cells, their structure and function.

216. *Cell and Molecular Biology Methods.* I. 3 hr. PR: Biol. 104 or consent. Introduction to the theory and application of basic analytical tools used in molecular biology. Selected topics included are: hydrodynamic methods, chromatography, electrophoresis, and general laboratory methods. *(Offered in Fall of even years.)*

217. *Methods in Ecology and Biogeochemistry.* II. 3 hr. PR: Biol. 103 and consent. Introduction to the theory and application of basic analytical tools used in ecology and biogeochemistry. Topics include sampling of terrestrial and aquatic organisms and their environment, and chemical analysis of biological materials. *(Offered in Spring of odd years.)*

231. *Animal Behavior.* I. 4 hr. PR: Biol. 1 and 2 or Psych. 1, or equiv. Introduction to animal behavior (ethology) emphasizing the biological bases and evolution of individual and social behaviors; laboratory includes independent investigation of behavioral phenomena.

232. *Physiological Psychology.* I. 3 hr. PR: 9 hr. psychology, behavior, physiology, or graduate standing. Introduction to physiological mechanisms and the neural basis of behavior. *(Also listed as Psych. 232.)*

233. *Behavioral Ecology.* II. (Alternate Years.) 3 hr. PR: Biol. 231 or consent. Consideration of the influences of environmental factors on the short and long term regulation, control, and evolution of the behaviors of animals.

234. *Physiology of Animal Behavior.* II. (Alternate Years.) 3 hr. PR: Biol. 231 or consent. Explores the way behavior is controlled in a wide variety of animals so that commonalities and varieties of neural and endocrine mechanisms may be better understood.

235. *Primate Behavior*. II. 3 hr. PR: Consent. Primates as they exist in their natural habitats, as they suggest clues to human behavior and the evolution of behavior. Case studies and comparative primate behavior of prosimians to monkeys, to apes, to human hunters and gatherers. *(Also listed as Soc. & A. 257.)*

243. *Plant Ecology*. I. 4 hr. PR: Biol. 1 and 2 or equiv. Environmental and ecological relationships of plants.

246. *Limnology*. I. 4 hr. PR: Biol. 103 or consent. Physical, chemical, and biological characteristics of inland waters with an introduction to the principles of biological productivity.

250. *Aquatic Seed Plants*. I. 3 hr. PR: Biol. 1 and 2, or equiv. Classification, ecology, and economic importance of aquatic seed plants.

251. *Principles of Evolution*. I, S. 3 hr. PR: Biol. 1 and 2 or equiv. Introduction to the study of evolution.

252. *Flora of West Virginia*. II, S. 3 hr. PR: Biol. 1 and 2 or equiv. Consideration of the native plant life of the state.

253. *Plant Anatomy*. I. 4 hr. PR: Biol. 1 and 2 or equiv. Anatomy of seed plants. *(Offered in Fall of odd years.)*

254. *Plant Geography*. II, S. 3 hr. PR: Biol. 1 and 2 or equiv. Study of plant groupings and worldwide distribution of plants.

255. *Invertebrate Zoology*. II. 4 hr. PR: Biol. 1 and 2 or equiv. Advanced study of animals without backbones.

256. *Ornithology*. II. 3 hr. PR: Biol. 1 and 2 or equiv. Lecture and laboratory studies on ancestry, evolution, topography, anatomy and physiology, systematics, behavior, migration, and ectoparasites of birds. Field studies will be limited in scope. *(Also listed as W. Man. 122.)*

257. *Ichthyology*. I. 3 hr. PR: Biol. 101 or consent. Internal and external structure of fishes, their systematic and ecological relationships, and their distribution in time and space. *(Dissection kit required.)*

258. *Mammalogy*. II. 3 hr. PR: Biol. 103 or W. Man. 224 and consent. Mammals and their biological properties with emphasis on life history, ecology, and distribution of regional forms. *(Also listed as W. Man. 225.)*

259. *General Parasitology*. II. 4 hr. PR: Biol. 1 and 2 or equiv. Introduction to the biology of parasites. *(Dissection kit required.) (Also listed as M. Bio. 224.)*

260. *Plant Development*. I. 4 hr. PR: Biol. 102, organic chemistry or biochemistry, or consent. Experimental studies of plant growth and development.

261. *Comparative Anatomy*. I. 4 hr. PR: Biol. 1 and 2 consent. A functional and evolutionary study of vertebrate structure. *(Dissection kit required.)*

262. *Vertebrate Embryology*. II. 4 hr. PR: Biol. 1 and 2 or consent. An experimental and descriptive analysis of vertebrate development.

263. *Vertebrate Microanatomy*. II. 5 hr. PR: Biol. 261 and consent. Structural and functional approach to the study of tissues and organs of vertebrates.

265. *Comparative Neuroanatomy*. I. 4 hr. PR: Biol. 261 and consent. Comparative study of development and anatomy of the nervous systems of the vertebrates. *(Dissection kit required.)*

268. *Physiology of the Endocrines*. I, S. 3 hr. PR: Biol. 102, or equiv., Ag. Bi. 210 or consent. Regulation of the organs of internal secretions and mechanisms of action of the hormones produced.

269. *Physiology of the Endocrines—Laboratory.* I. 1 hr. PR or Conc.: Biol. 268. Experimental techniques used in study of the endocrine system.

270. *General Animal Physiology.* I. 3 hr. PR: Biol. 1. In-depth, current treatment of physiological principles which operate at various levels of biological organization in animals of diverse taxonomic relationships. Understanding is developed from background lectures and student analysis in discussion sessions of research literature.

271. *General Animal Physiology—Laboratory.* I. 1 hr. PR or Conc.: Biol. 270. After learning basic techniques, students are provided the opportunity to design, execute, and report upon an independent research project in physiology.

309. *Topics and Problems in Biology.* I, II, S. 1-4 hr. PR: Consent. Topics and problems in contemporary biology, to be selected in consultation with the instructor.

311. *Biology Seminar.* I, II. 1 hr. Discussions and presentations of general interest to biologists.

315. *Molecular Basis of Virology.* I. 3 hr. PR: Biol. 104 or consent. Lectures on bacterial, animal and plant viruses; their structure, replication, and interaction with host cells. Discussion of the contributions virology has made to the understanding of molecular mechanisms in biology.

331. *Sociobiology.* I. (Alternate Years.) 3 hr. PR: Biol. 231 or equiv. Concepts in the biological bases of social behavior in animals. Emphasis is on the evolution of sociality and the principles underlying social interactions.

340. *Ecosystem Dynamics.* I. 3 hr. PR: Biol. 103 or equiv. Studies of modern approaches to ecosystem analysis. Emphasis will be on energy and material transfers. Approach will be holistic.

345. *Fisheries Science.* II. 4 hr. PR: Biol. 257 consent. Population dynamics in relation to principles and techniques of fish management. *(Offered in Spring of odd years.)*

346. *Production Limnology.* II. 3 hr. PR: Biol. 103 or 246 or equiv. Production in fresh-water ecosystems. Emphasis will be on methodology and results of research. Both primary and secondary production dynamics will be discussed.

352. *Plant Morphology (Bryophytes and Vascular Plants).* II. 4 hr. PR: Biol. 1 and 2 or equiv. Development and structure of the bryophytes and vascular plants. *(Offered in Spring of odd years.)*

354. *Fresh-Water Algae.* I. 4 hr. PR: Biol. 1 and 2 or equiv. Taxonomy, cytology, and ecology of aquatic, aerial, and land forms of fresh-water algae. *(Offered in Fall of even years.)*

355. *Advanced Plant Systematics 1.* II. 3 hr. PR: Biol. 151 or equiv. Taxonomy of pteridophytes, gymnosperms, and monocotyledons. *(Offered in Spring of odd years.)*

356. *Advanced Plant Systematics 2.* 3 hr. PR: Biol. 151 or equiv. Taxonomy of dicotyledons. *(Offered only in Spring of even years.)*

358. *Field Study of Invertebrates.* S. 3 hr. PR: Biol. 1 and 2 or equiv. Taxonomy and ecology of the invertebrates.

359. *Field Study of Vertebrates.* S. 3 hr. PR: Biol. 1 and 2 or equiv. Taxonomy and ecology of the vertebrates.

362. *Developmental Biology.* I. 3 hr. PR: Biol. 101, 102, 262 or equiv. and organic chemistry. The molecular and cellular basis of differentiation and morphogenesis. *(Offered in Fall of even years.)*

364. *Advanced Plant Physiology.* I, II. 3 hr. PR: Biol. 169 or equiv., organic chemistry, general physics, and consent. Advanced studies of plant processes including recent advances in the field. *I. Second Semester, odd-numbered years—Water relations and mineral nutritition and translocation. II. First Semester, odd-numbered years—Plant growth and development. III. Second Semester, even-numbered years—Environmental physiology.*

365. *Environmental Physiology.* II. 4 hr. PR: Biol. 101 or consent. Physiological mechanisms by which organisms adapt to their environments, comparing adaptations of phyletically different organisms to similar environments and the adaptations of similar organisms to different environments. *(Offered in Spring of even years.)*

375. *Fundamentals of Gerontology.* II. 3 hr. PR: MDS 50 or consent. An advanced multidisciplinary examination of current research in biological, psychological, and sociological issues of human aging and the ways in which these impinge on the individual to create both problems and new opportunities. *(Also listed as Psych. 375 and Soc. & A. 375.)*

Chemistry

Faculty

William R. Moore, Ph.D. (U. Minn.), *Chairperson and Professor.*
Nar S. Dalal, Ph.D. (U. Br. Col., Can.), *Associate Professor.*
Daniel M. Downey, Ph.D. (LSU), *Assistant Professor.*
Gabor B. Fodor, Ph.D. (U. Szeged, Hungary), *Centennial Professor.*
John A. Gibson, Jr., Ph.D. (MIT), *Professor Emeritus.*
Alan R. Gregory, Ph.D. (Australian Natl. U.), *Assistant Professor.*
George A. Hall, Jr., Ph.D. (Ohio St. U.), *Professor of Chemistry and Forestry.*
James L. Hall, Ph.D. (U. Wisc.), *Professor Emeritus.*
George L. Humphrey, Ph.D. (Ore. St. U.), *Professor Emeritus.*
Paul Jagodzinski, Ph.D. (Tex. A&M U.), *Assistant Professor.*
Dennis W. H. MacDowell, Ph.D. (MIT), *Professor.*
Eric A. Mintz, Ph.D. (U. Mass.), *Assistant Professor.*
Chester W. Muth, Ph.D. (Ohio St. U.), *Professor and Associate Chairperson.*
Robert S. Nakon, Ph.D. (Tex. A&M U.), *Associate Professor.*
Armine D. Paul, Ph.D. (U. Cal.), *Professor.*
Jeffrey L. Petersen, Ph.D. (U. Wisc.), *Associate Professor.*
Peter Popovich, Ph.D. (Wash. St. U.), *Professor Emeritus.*
Kenneth C. Showalter, Ph.D. (U. Colo.), *Associate Professor.*
Ronald B. Smart, Ph.D. (U. Mich.), *Assistant Professor.*
John H. Strohl, Ph.D. (U. Wisc.), *Associate Professor.*
Kung K. Wang, Ph.D. (Purdue U.), *Assistant Professor.*
Anthony Winston, Ph.D. (Duke U.), *Professor.*

Major in Chemistry—B.S.

The Bachelor of Science degree in chemistry is designed for those students who desire to qualify for professional positions in industry and governmental services as well as those who plan to do graduate work in chemistry. Requirements for the Bachelor of Science degree are listed below. Electives must be chosen so as to meet the basic requirements of the College of Arts and Sciences and the Department of Chemistry. A total of 136 hours is required, subject to the general course exclusions for all degrees. The college language requirement must include two semesters of scientific German or Russian. A second language is recommended. Students wishing to pursue an honors program should include Chem. 194 in chemistry electives. However, only 6 hours of Chem. 192, 194 or 202, separately or combined, may be counted toward meeting chemistry elective requirements. Also one course in the Department of Chemistry, exclusive of Chem. 192, 194, and 202, must be included in the chemistry elective courses.

Admission to the program and continuance for the third and subsequent semesters requires at least a cumulative average of 2.0 for courses in chemistry taken in the Department of Chemistry at WVU.

Required Courses

Chem. 17 and 18, or Chem. 15, 16, and 115; Chem. 133, 134, 135, 136, 201, 210, 222, 235, 246, 247 (concurrent with Chem. 246), 248, 249, 250, plus 9 hours of chemistry electives approved by the department; Math. 15, 16, 17; Phys. 11, 12; Ger. 121, 122; or two semesters of scientific Russian.

Approved Electives in Chemistry

Chem. 192, 194, 202, 211, 212, 237, 239, 241, 243, 244, 315, 331, 332, 341.

Recommended Courses in Other Areas

Ag. Bi. 210 or 310; C.S. 1, 120; E.E. 201, 272; Engl. 208; Math. 18, 113, 214; Phys. 124, 213, 225; Stat. 231.

Major in Chemistry—B.A.

The course requirements for the Bachelor of Arts degree with a major in chemistry are designed to meet the needs of those students who desire to go into careers which require a good background in the basic principles of chemistry. Areas such as medicine, dentistry, or other health-related sciences, secondary school teaching, or chemical laboratory technical work, may be pursued by proper choice of electives. Only 6 hours of Chem. 192, 194, or 202, separately or combined, may be counted toward meeting chemistry elective requirements. Also one course in the Department of Chemistry, exclusive of Chem. 192, 194, and 202, must be included in the chemistry elective courses.

Admission to the program and continuance for the third and subsequent semesters requires at least a cumulative average of 2.0 for courses in chemistry taken in the Department of Chemistry at WVU.

Required Courses

Chem. 15, 16, and 115, or Chem. 17 and 18; Chem. 133, 134, 135, 136, 141, 142 (concurrent with Chem. 141), plus 8 hours of chemistry electives approved by the department: Phys. 1, 2; Math. 15, 16; Biol. 1, 2.

Approved Electives in Chemistry

Chem. 192, 194, 201, 202, 210, 211, 212, 235, 237, 239, 241, 243, 244, 315, 331, 332.

Recommended Courses in Other Areas

Ag. Bi. 210 or 310; C.S. 1, 120; E.E. 201, 272; Engl. 208; Math. 17, 18; Stat. 101.

Honors Program

To be eligible for admission to the departmental Honors Program, a student must have a 3.5 average in chemistry courses taken at WVU and must have the endorsement of the chemistry faculty.

A student may apply for initial admission to the program at any time after the student's first semester and no later than three semesters before graduation.

Application will be made to the departmental adviser who will serve as temporary adviser to the student.

A student re-entering the program, after having been out of it for a period of time, may in some cases be allowed to re-enter as late as the student's last semester in residence.

Courses of Instruction in Chemistry (Chem.)

Note: A charge is made for breakage in laboratory courses and for failure to check out of the laboratory.

Lower Division

10. *Introduction to Chemistry*. I, II. 2 hr. Required for students whose performance on a departmental examination indicates need for introductory work before enrolling in other chemistry courses. Scientific terminology and concepts; chemical arithmetic; chemical symbols, formulae and equations; mole concepts; problem solving. May not count for credit toward graduation if taken after credit for another course in chemistry has been established. 1 hr. lec., 1 hr. rec.

11. *Survey of Chemistry*. I. 4 hr. PR: Satisfactory performance on departmental examination, or Chem. 10. Designed primarily for students taking only one year of college chemistry. Atomic structure; chemical bonding; acids, bases, and salts; periodicity; properties of gases, liquids, and solids; stoichiometry; oxidation-reduction. 2 hr. lec., 1 hr. rec., 3 hr. lab. *(Students may not receive credit for Chem. 15 or 17 and for Chem. 11.)*

12. *Survey of Chemistry*. II. 4 hr. PR: Chem. 11. Continuation of Chem. 11. Nuclear chemistry; air and water pollution; useful natural materials; consumer chemistry; introduction to organic and biochemistry. 2 hr. lec., 1 hr. rec., 3 hr. lab. *(Students may not receive credit for Chem. 16 or 18 and for Chem. 12.)*

15. *Fundamentals of Chemistry*. I, II. 4 hr. PR: Satisfactory performance on departmental examination, or grade of C or higher in Chem. 10. For students who need more than one year of college chemistry and for students in engineering. Develops terminology, conceptual foundations, and quantitative relationships on which subsequent courses in chemistry will be built. 2 hr. lec., 1 hr. rec., 3 hr. lab. *(Students may not receive credit for Chem. 17 and for Chem. 15.)*

16. *Fundamentals of Chemistry*. I, II. 4 hr. PR: Chem. 15. Continuation of Chem. 15. 2 hr. lec., 1 hr. rec., 3 hr. lab. *(Students may not receive credit for Chem. 18 and for Chem. 12 or 16.)*

17. *Principles of Chemistry*. I. 5 hr. PR: High school chemistry and satisfactory performance on departmental examination, or Chem. 10. A more advanced treatment of the principles and theories of chemistry than offered in Chem. 15 and 16. Primarily for students specializing in chemistry. 3 hr. lec., 1 hr. rec., 3 hr. lab. *(Students may not receive credit for Chem. 17 and for Chem. 11 or 15.)*

18. *Principles of Chemistry*. II. 5 hr. PR: Chem. 17. Continuation of Chem. 17. 2 hr. lec., 1 hr. rec., two 3 hr. lab. *(Students may not receive credit for Chem. 18 and for Chem. 12, 16, or 115.)*

Upper Division

115. *Introductory Analytical Chemistry*. I, II. 4 hr. PR: Chem. 16. Volumetric analysis, gravimetric analysis, solution equilibria, spectrophotometry, separations, and electrochemical methods of analysis. 2 hr. lec., two 3 hr. lab. *(Students may not receive credit for Chem. 115 and for Chem. 17 and 18.)*

131. *Organic Chemistry: Brief Course*. II. 4 hr. PR: Chem. 16. Emphasis on biological applications for students in medical technology, agriculture, and family resources. Nomenclature, structure, reactivity, and stereochemistry are stressed. 3 hr. lec., 3 hr. lab. *(Students may not receive credit for Chem. 131 and for Chem. 133 and 134.)*

133. *Organic Chemistry*. I, II. 3 hr. PR: Chem. 16 or 18 and 135 or concurrent enrollment. Basic principles of organic chemistry. Modern structural concepts, the effect of structure on physical and chemical properties, reactions and their mechanisms and application to syntheses. 3 hr. lec. *(Students may not receive credit for Chem. 133, 134, and for Chem. 131.)*

134. *Organic Chemistry*. I, II. 3 hr. PR: Chem. 133, 135, and 136 or concurrent enrollment in Chem. 136. Continuation of Chem. 133. 3 hr. lec.

135. *Organic Chemistry Laboratory*. I, II. 1 hr. PR or Conc.: Chem. 133. Fundamental organic reactions and the preparation of organic compounds. 3 hr. lab.

136. *Organic Chemistry Laboratory*. I, II. 1 hr. PR: Chem. 133, 135 and 134, or concurrent enrollment in Chem. 134. Continuation of Chem. 135. 3 hr. lab.

141. *Physical Chemistry: Brief Course*. I, II. 3 hr. PR: Chem. 16 (Chem. 115 if chemistry major.) Math. 16, Phys. 2 or 12. Beginning physical chemistry covering the subjects of chemical thermodynamics, chemical dynamics, and the structure of matter. 3 hr. lec. *(Students may not receive credit for Chem. 246 and 248 and for Chem. 141.)*

142. *Experimental Physical Chemistry*. I, II, S. 1 hr. PR or Conc: Chem. 141 or 246; Chem. 115, or Chem. 131, or Chem. 135. Laboratory work in physical chemistry designed to accompany Chem. 141. One 3-hr. lab.

192. *Undergraduate Research*. I, II. 1-3 hr. (May be repeated for credit.) PR: Written consent and a 3.0 grade-point average in chemistry courses. Individual investigations under supervision of an instructor. 3-9 hr. lab.

194. *Honors Course*. I, II. 1-3 hr. (May be repeated for credit.) PR: Written consent and at least a 3.5 average in chemistry courses taken in the department. Research for students in the departmental honors program. Thesis required.

201. *Chemical Literature*. II. 2 hr. PR: Chem. 131 or 134. Study of techniques of locating, utilizing, and presenting information needed by the research worker in chemistry. 2 hr. lec.

202. *Selected Topics*. I, II. 1-3 hr. (May be repeated for credit.) PR: Written consent, with at least a 2.0 grade-point average in chemistry courses. Individual instruction under supervision of an instructor.

210. *Instrumental Analysis*. II. 3 hr. PR: Chem. 115, 246. Basic instrumentation of analytical measurements. Electronics and instrument design. Methods of electrochemical and spectrochemical analysis. 2 hr. lec., 3 hr. lab.

211. *Intermediate Analytical Chemistry*. I. 3 hr. PR: Chem. 115 and physical chemistry. Principles of analytical procedures and separations at an intermediate level. 3 hr. lec.

212. *Environmental Chemistry*. II. 3 hr. PR: Chem. 115, 134, and physical chemistry. Study of the nature, reactions, transport, and fates of chemical species in the environment.

222. *Chemistry of Inorganic Compounds*. II. 3 hr. PR: Physical chemistry. Correlation of reactions and properties of elements and compounds based on modern theories of chemical bonding and structure. Acid-base theory, non-aqueous solvents, ligand field theory, and stereochemistry. 3 hr. lec.

235. *Methods of Structure Determination*. I. 4 hr. PR: Chem. 134 and 136. Use of chemical methods and uv, ir, nmr, esr, Raman and mass spectroscopy to elucidate structures of organic compounds. For students in chemistry and related fields who may need these methods in research and applied science. 2 hr. lec., two 3-hr. lab.

237. *Polymer Chemistry*. I or II. 3 hr. PR: Chem. 134 and physical chemistry. Methods, mechanisms, and underlying theory of polymerization. Structure and stereochemistry of polymers in relation to chemical, physical, and mechanical properties. 3 hr. lec.

239. *Organic Syntheses*. II. 2 hr. PR: Chem. 134, 136. Modern synthetic methods of organic chemistry. Two 3-hr. lab.

241. *Crystallography*. I or II. 3 hr. PR or Conc.: Physical chemistry or consent. Applications of X-ray diffraction of crystals to study of crystal and molecular structure. Includes theories of diffraction and crystallographic methods of analysis. 3 hr. lec. *(Course will not be offered in 1983-84.)*

243. *Introduction to Radiochemistry and Radiation Chemistry*. I. 3 hr. PR or Conc.: Physical chemistry. Fundamentals of radiochemistry and the use of tracer techniques. An introduction to radiation chemistry and how ionizing radiation interacts with matter. 2 hr. lec., 3 hr. lab.

244. *Colloid and Surface Chemistry*. II. 3 hr. PR: Physical chemistry. Selected topics in the properties and physical chemistry of systems involving macromolecules, lyophobic colloids, and surfaces. 3 hr. lec.

246. *Physical Chemistry*. I. 3 hr. PR: Chem. 134, Math. 16, and Phys. 12. A first course in physical chemistry. Topics include a study of thermodynamics and chemical equilibria. 3 hr. lec. *(Students may not receive credit for Chem. 246 and for Chem. 141.)*

247. *Physical Chemistry Laboratory*. I. 1 hr. PR: Chem. 18 or 115; PR or Conc.: Chem. 246. Experimentation illustrating the principles of physical chemistry and offering experience with chemical instrumentation. One 3-hr. lab.

248. *Physical Chemistry*. II. 3 hr. PR: Chem. 246 and Math. 17. Continuation of Chem. 246. Chemical dynamics and the structure of matter. 3 hr. lec. *(Students may not receive credit for Chem. 248 and for Chem. 141.)*

249. *Physical Chemistry Laboratory*. II. 2 hr. PR: Chem. 246, 247, 248, or concurrent enrollment in Chem. 248. Continuation of Chem. 247. Two 3-hr. lab.

250. *Chemical Bonding and Molecular Structure*. I. 3 hr. PR: Chem. 248. Introduction to the quantum theory of chemical bonding. Atomic structure, theoretical spectroscopy, predictions of molecular structures and bond properties. 3 hr. lec.

315. *Chemical Separations*. II. 3 hr. PR: Chem. 115, 133, and physical chemistry. Modern methods of chromatography from a theoretical and practical standpoint. General principles of separation stressing the practical implementation of these principles with particular emphasis on high performance liquid chromatography and gas chromatography. 3 hr. lec.

331. *Advanced Organic Chemistry 1*. I. 3 hr. PR: Chem. 134. Structural concepts, bonding, tautomerism, static and dynamic stereochemistry, mechanistic classifications of reagents, and reactions including some applications. 3 hr. lec.

332. *Advanced Organic Chemistry 2*. II. 3 hr. PR: Chem. 331. Continuation of Chem. 331 with emphasis upon synthetic methods and reaction mechanisms. 3 hr. lec.

341. *Chemical Thermodynamics*. I or II. 3 hr. PR: Chem. 248. Principles of classical and statistical thermodynamics and their application to chemical problems. 3 hr. lec.

Comparative Literature

See Interdepartmental Majors, page 90.

Computer Science

Faculty

Donald F. Butcher, Ph.D. (Iowa St. U.), *Chairperson and Professor.*
John M. Atkins, Ph.D. (U. Pitt), *Assistant Professor.*
Anthony A. Billings, M.S. (WVU), *Lecturer.*
Daniel M. Chilko, M.S. (Rutgers U.), *Associate Professor.*
William H. Dodrill, M.S. (MIT), *Associate Professor.*
James S. Foltz, B.S. (WVU), *Lecturer.*
D. Michael Henry, Ph.D. (TCU), *Associate Professor.*

Malcolm G. Lane, Ph.D. (Duke U.), *Professor; Associate Chairperson.*
James D. Mooney, Ph.D. (Ohio St. U.), *Associate Professor.*
Wayne A. Muth, Ph.D. (Iowa St. U.), *Professor.*
Y. V. Reddy, Ph.D. (WVU), *Associate Professor.*
George E. Trapp, Jr., Ph.D. (Carnegie-Mellon U.), *Professor.*
Gretchen L. Van Meer, Ph.D. (Northwestern U.), *Lecturer.*
Frances L. Van Scoy, Ph.D. (U. Va.), *Associate Professor.*

Admission to Pre-Computer Science Program of Study

General requirements for admission to the pre-Computer Science program of study are that all prospective students must qualify for admission to WVU and to the College of Arts and Sciences and present secondard school credit for 2 units of algebra, 1 unit of geometry, and ½ unit of trigonometry or advanced mathematics or 1 unit of chemistry or physics.

Additional Admission Requirements: Applicants must take the Standard ACT test and automatic admission to pre-Computer Science will be based on the following:

West Virginia Residents: A high school grade-point average of at least 3.0 or a Standard ACT Mathematics score of at least 24.

Out-of-State Residents: A high school grade-point average of at least 3.3 or a Standard ACT Mathematics score of at least 26. Applicants not satisfying these admission requirements may gain admission to pre-Computer Science as transfer students described below.

Transfer Students: Students wishing to transfer .into pre-Computer Science or Computer Science, must satisfy WVU admission requirements, Arts and Sciences admission requirements, and as a minimum: (1) Have a grade-point average of at least 3.0 for all college-level work attempted; (2) Have earned at least a C in Mathematics 15 and 16 and have at least a 2.5 grade-point average on all computer science, mathematics, and statistics course work attempted; (3) Have satisfied "Departmental Admissions Requirements" listed below on all Computer Science course work attempted.

Students not meeting these minimum transfer requirements, but who display special aptitude for computer science studies, may request to be admitted to the Department of Statistics and Computer Science on a provisional basis. Petitions should be addressed to the Computer Science Academic Standards Committee and delivered to the department.

The number of transfer students accepted into the department will be governed by the enrollment capacities of the degree programs. First admission priority will be granted to those students currently matriculated at WVU; second priority to students enrolled in computer science curricula at external colleges and universities; third priority to students enrolled in other degree programs at external colleges and universities. Within the last two priorities, preferential admission will be in the following order: West Virginia residents, U.S. citizens or permanent residents, and foreign students.

Admission to Computer Science Degree Program

To be admitted to the bachelor of science degree program in computer science, students must:

a. Earn at least a C in C.S. 1 before enrolling in C.S. 2.

b. Earn at least a C in C.S. 2 and a 2.5 grade-point average in C.S. 2 before enrolling in C.S. 50.

c. Earn at least a C in C.S. 50 before enrolling in C.S. 51.

d. Earn at least a C in C.S. 51 and a 2.5 grade-point average in C.S. 50-51.

e. Earn at least a C in Math. 15 and 16.

Students are allowed to repeat one course from each sequence; the first grade in a course that was repeated will not be counted.

Degree Program

The Department of Statistics and Computer Science offers a degree program leading to a Bachelor of Science in Computer Science. The degree program is designed to qualify students for professional positions in industry, research, government service, or graduate study in computer science.

The computer science program is intended to educate students in the following areas of computer science: mathematical procedures, programming languages, systems programming, information analysis, and systems design. After taking an upper-division course in at least three of these areas (C.S. 220, 230, 240, and 260), students are encouraged to take advanced course work in areas of interest to them.

Degree Program Requirements

Computer science majors must complete at least 60 hours of upper-division course work with at least 20 hours of upper-division course work in computer science, 6 hours of approved technical electives, and 3 hours in statistics. A student must earn at least a C in all courses counted towards meeting the upper-division hours in computer science, statistics, and approved technical electives.

Required Courses

Math. 15, 16; Stat. 201; C.S. 1, 2, 50, 51, 120, 196, 220, 230, 240, 260; 6 additional hours of 200-level computer science course work; plus 3 additional hours of approved technical electives; and at least 60 hours of upper-division course work. No more than 10 hours of 190-199 course work may be used in fulfilling the 60-hour, upper-division requirement.

Approved Technical Electives

Any 200-level computer science course, excluding individual study taken as C.S. 291; any 300-level computer science course excluding C.S. 301; Stat. 221; Math. 241; E.E. 271, 272, 372, 373, 374; I.E. 283, 284.

Courses of Instruction in Computer Science (C.S.)

Lower Division

1. *Introduction to Computer Science.* I, II, S. 4 hr. Algorithms, programs and computers. Organization and characteristics of computers. Basic programming structure.

2. *Computer Language Concepts.* I, II, S. 4 hr. PR: C.S. 1 or equiv. Advanced programming using the PL/I Programming Language. Major topics include: structured programming techniques, file organizations and implementations, and list processing. Realistic programming assignments are used to illustrate solution techniques.

5. *Computer Applications for Business.* I, II. 4 hr. Algorithms, programs and computers. Organization and characteristics of computers. Basic program structure. Programming in the FORTRAN language. Emphasis on business applications.

50. *Computer Organization and Assembler Programming.* I. 4 hr. PR: C.S. 2. Introduction to the organization of a computer and to programming in an assembler language. Major topics include number systems, machine language, subroutine linkage, arithmetic operations, input and output and macros.

51. *Principles of Computer Science.* II. 4 hr. PR: C.S. 50. Data structures, algorithms and advanced programming techniques. Topics include linking subroutines from libraries, stacks, queues and lists, memory management, trees, searching algorithms, sorting algorithms and analysis of algorithms.

60. *Introduction to COBOL Programming.* I. 3 hr. PR: A high-level programming language. COBOL programming assignments will be used to illustrate many features of the language, including the ability to manipulate different types of files.

Upper Division

120. *Discrete and Numerical Methods.* II. 4 hr. PR: An introductory computer programming course and Math. 16. Set algebra, propositional logic and applications to circuits. Directed and undirected graphs, trees. Errors in numerical computation; interpolation, quadrature, solution of nonlinear and differential equations. Finite Markov chains, queueing theory.

190. *Teaching Practicum.* I, II, S. 1-6 hr. (May be repeated for a maximum of 6 hours.) PR: C.S. 51. Practical classroom experience for undergraduate teaching assistants. Tasks assigned are those designed to provide experience with course design, implementation, evaluation and revision of classroom work.

195. *Field Experience.* I, II, S. 1-18 hr. PR: C.S. 51. *(Total credit applicable toward any Arts and Sciences degrees may not exceed the maximum of 18 hours.)* Course for those who wish to work with faculty and field supervisors to design field experiences with planned learning objectives and credit goals.

196. *Computer Science Seminar.* I, II. 1 hr. PR: C.S. 51. Satisfactory completion of the course requires that the student present a 20- to 50-minute talk on a selected topic and attend all scheduled meetings.

197. *Computer Science Practicum.* I, II, S. 1 hr. PR: C.S. 51. *(Open to computer science majors only.)* Assisting in operation of a computer to become familiar with computer and peripheral devices.

220. *Numerical Analysis 1.* I. 3 hr. PR: C.S. 120 or Math. 18, and C.S. 1. Error estimation, solutions of equations and approximations. Numerical integration and solution of initial value ordinary differential equations.

221. *Numerical Analysis 2.* II. 3 hr. PR: C.S. 220 and Math. 241 or consent. Solutions of linear systems by direct and iterative methods. Calculation of eigenvalues, eigenvectors, and inverses of matrices. Applications to ordinary and partial differential equations.

230. *Programming Languages.* I. 3 hr. PR: C.S. 51. Formal definition of programming languages including specification of syntax and semantics. Structure of simple statements and algorithmic languages. List processing and string manipulation languages.

240. *Systems Programming.* I, II. 4 hr. PR: C.S. 51. Software organization for the support of computer components. Addressing techniques process and data modules, file system organization and management. Traffic control and communication with peripheral devices.

241. *Systems Programming.* II. 3 hr. PR: C.S. 240. Memory management; name management; file systems; segmentation; protection; resource allocation; pragmatic aspects in the design and analysis of operating systems.

260. *Information Analysis.* II. 3 hr. PR: C.S. 51. Information analysis and logical design of a computer system. Exercises and case studies are used to give students proficiency in information analysis techniques. Projects are assigned to provide practical experience in systems development and implementation.

270. *System Design.* I. 3 hr. PR: C.S. 51 or consent. Underlying principles of system design and techniques. A theme to be carried throughout the course is the iterative nature of the analysis and design process. Implementation and conversion problems also are considered. Practical projects are assigned to give students experience in actual situations.

281. *Introduction to Artificial Intelligence.* I. 3 hr. PR: C.S. 51 or consent. Introductory treatment of foundations of AI and the symbol manipulation language LISP. Survey of the field of AI, production systems, search strategies, game playing, knowledge engineering, weak methods. Applications of AI will be briefly studied.

285. *Computer Organization and Architecture.* I. (Alternate Years.) 3 hr. PR: C.S. 50 and 51. Architecture of current computers and their effects on software design. Von Neumann machines; gates and registers; instruction and address decoding; memory systems; input-output systems; micros, supercomputers, specialized systems. *(Course will not be offered in 1983-84.)*

291. *Special Topics.* I, II, S. 1-6 hr. PR: Consent. Advanced study of special topics in computer science.

301. *Computers in Research.* I. 3 hr. *(Statistics and Computer Science majors should obtain their graduate committee approval before registering.)* Use of computers in research. Algorithms and programming. Scientific and statistical programming packages.

303. *Microcomputers in Mathematics/Science.* S. 3 hr. PR: Math. 3 or consent. An integrated course in computer science, statistics, and mathematics for secondary educators. Focuses on programming techniques and uses problems from the areas of statistics and mathematics at the high school level as examples.

310. *Application Programming 1.* I. 3 hr. PR: Programming knowledge. Survey of computer application areas by industry, and summary of basic techniques used in computer applications problems, illustrated with real world examples. Options and decisions involved in problem solving emphasized.

311. *Application Programming 2.* II. 3 hr. PR: C.S. 310 or consent. Continuation of C.S. 310 where students work on a particular project under supervision of a faculty member and present a written and oral report on their project.

320. *Numerical Solution of Linear Equations.* 3 hr. PR: C.S. 220 or consent. Numerical solution of large systems of linear equations using direct and iterative methods. Calculation of inverses and generalized inverses of matrices. Numerical methods for the determination of eigenvalues and eigenvectors.

330. *Design of Language Processors.* II. 3 hr. PR: C.S. 230. Study of the design and construction of automatic programming language processors. Investigation of the structure of scientific and business oriented compilers, list processors, and information processing languages.

340. *Theory of Operating Systems.* I. (Alternate Years.) 3 hr. PR: C.S. 240. Theoretical aspects of multiprogrammed and virtual operating systems. Topics include: concurrent processes, processor management, storage management, scheduling algorithms, and resource protection.

341. *Computer Science.* II. 3 hr. PR: C.S. 340 and Stat. 312, or consent. Simulation, evaluation, and measurement of computer systems. Techniques of measurement and evaluation using hardware and software monitors, methods of model validation, and creation of management reports. *(Course will not be offered in 1983-84.)*

350. *Software Engineering in Data Communications.* II. 3 hr. PR: C.S. 240 or consent. Data communications principles, software design techniques for implementing data communications systems, testing and debugging techniques, networks and data link control, software design in a network environment. A "hands-on" project in data communications design is included.

360. *Design of Database Systems.* I. 3 hr. PR: C.S. 260 or consent. Design, evaluation, implementation, and user interface of database systems. Topics include: storage structures, data languages, security, and relational, hierarchical and network implementation approaches.

370. *System Implementation.* II. 3 hr. PR: C.S. 220, 260, and 270 or consent. Underlying principles of system implementation are covered both from a theoretical and from a practical point of view. As part of the course, each student will participate with other students in the implementation of a production system.

380. *Interactive Computer Graphics.* II. 3 hr. PR: C.S. 230 or 240 or 260 or consent. Data structures and list handling; picture structures and transformations; rendering of surfaces and solids; interaction handling; display processors and programming systems; and graphics system organization.

Economics

Faculty

Donald R. Adams, Ph.D. (U. Penn), *Chairperson and Professor.*
Vance Q. Alvis, Ph.D. (U. Va.), *Professor.*
Lewis C. Bell, Ph.D. (U. Ky.), *Professor.*
Robert D. Britt, Ph.D. (U. Colo.), *Professor.*
Jeffrey A. Clark, Ph.D. (U. Ill.), *Assistant Professor.*
Steven D. Culler, Ph.D. (U. Ill.), *Assistant Professor.*
Brian J. Cushing, Ph.D. (U. Md.), *Assistant Professor.*
Randyl D. Elkin, Ph.D. (Iowa St. U.), *Associate Professor.*
Michael S. Fogarty, Ph.D. (U. Pitt), *Associate Professor.*
Clifford B. Hawley, Ph.D. (Duke U.), *Assistant Professor.*
Ming-jeng Hwang, Ph.D. (Tex. A&M U.), *Associate Professor.*
Parviz Jenab, Ph.D. (Ind. U.), *Assistant Professor.*
Kern O. Kymn, Ph.D. (U. Chicago), *Professor.*
Walter C. Labys, Ph.D. (Nottingham U., England), *Adjunct Professor.*
Patrick C. Mann, Ph.D. (Ind. U.), *Professor.*
Paul J. Speaker, Ph.D. (Purdue U.), *Assistant Professor.*
James H. Thompson, Ph.D. (U. Pitt), *Professor.*
Royce J. Watts, M.S. (WVU), *Assistant Professor.*
Tom S. Witt, Ph.D. (Wash. U.), *Professor.*
Thomas J. Zlatoper, Ph.D. (Northwestern U.), *Assistant Professor.*

Programs

The College of Business and Economics offers all courses in economics, but these are recognized as a regular part of the program of the College of Arts and Sciences. The College of Business and Economics grants the degree of Bachelor of Science in Economics (B.S.). The College of Arts and Sciences grants the B.A. degree with a major in Economics.

The program leading to the B.A. degree is designed for students who wish to combine fundamental training in economics with a liberal arts education. The Core Curriculum requirements must be met in the choice of electives. Of the total 128 hours required for graduation, some 40 or more credit hours are available for elective subjects.

Major in Economics

Required Courses

Econ. 54, 55, 125, 211, 212, and one of the following courses: Econ. 110, 216, and 270. The student must take at least two non-economics courses in Core B, and must select one of the following courses sequences: Math. 3 and 128, Math. 15 and 16. The mathematics courses are to be credited toward the minimum of 12 hours required in Core C. Any student planning to pursue graduate work in economics should take Math. 15 and 16. Additional recommended courses can be determined in consultation with an economics adviser.

Majors are also required to take 15 additional hours of 100 or above economics courses. A minimum of 27 upper-division hours in economics is required of majors.

Courses of Instruction in Economics (Econ.)

Lower Division

51. *The Economic System.* I, II. 3 hr. Introduction to the analysis of the economic system. Pricing system, monetary system, determination of national income and employment. A one-semester principles course for non-majors.*

54. *Principles of Economics.* I, II. 3 hr. Elementary microeconomic analysis.

55. *Principles of Economics.* I, II. 3 hr. PR: Econ. 54. Elementary macroeconomic analysis.

Upper Division

110. *Comparative Economic Systems.* I or II. 3 hr. PR: Econ. 51 or 55. Structure and processes of existing economic systems throughout the world including review of basic principles of free enterprise, socialistic, communistic, and fascistic societies. Comprehensive analysis based on current and recent experiments in these economies.

125. *Elementary Business and Economic Statistics.* I, II, S. 3 hr. PR: Grade of C or better in either Math. 3 or Math. 14 or consent. Basic concepts of statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regression and correlation with emphasis on business and economic examples. *(Equiv. to Stat. 101.)*

130. *Money and Banking.* I, II. 3 hr. PR: Econ. 51 or 55. Our system of monetary and banking arrangements viewed in relation to functioning of the economic system as a whole.

160. *Labor Economics.* I, II, S. 3 hr. PR: Econ. 51 or 55. Survey of labor in the United States economy. Introduction to theories of employment and wage determination. Topics include labor history and law, the changing work roles of women, minority opportunities, and the problem of unemployment.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Econ. 51, 55 or consent. Special topics relevant to economics. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward the bachelor's and master's degrees.)*

205. *Current Economic Problems.* S. 3 hr. PR: Econ. 51, 55 or consent. *(For students in Education only.)* Acquaints public school teachers with reliable source materials in economics and instructs them in studying current economic problems.

*Non-majors who have completed Econ. 51 and who wish to take another economics course may take Econ. 54, Econ. 55, or any 100- or 200-level economics course for which they have the prerequisites.

211. *Intermediate Microeconomic Theory.* I, II. 3 hr. PR: Econ. 51 or 54. Consumer choice and demand; economics of time; price and output determination and resource allocation in the firm and market under a variety of competitive conditions; welfare economics, externalities, public goods, and market failure.

212. *Intermediate Macroeconomic Theory.* I, II. 3 hr. PR: Econ. 51 or 55. Forces which determine the level of income, employment, and output. Particular attention to consumer behavior, investment determination, and government fiscal policy.

213. *Economic Development.* I or II. 3 hr. PR: Econ. 51 or 55. The problems, changes, and principal policy issues faced by nonindustrialized countries.

216. *History of Economic Thought.* I or II. 3 hr. PR: Econ. 51 or 55. Economic ideas in perspective of historic development.

220. *Introduction to Mathematical Economics.* I or II. 3 hr. PR: Math. 15 or 128, and Econ. 51 or 55; or consent. Principal mathematical techniques including set operation, matrix algebra, differential and integral calculus employed in economic analysis. Particular attention given to static (or equilibrium) analysis, comparative-static analysis and optimization problems in economics.

225. *Applied Business and Economic Statistics.* I, II. 3 hr. PR: Econ. 125 or Stat. 101 or consent. Continuation of Econ. 125. Principal statistical methods used in applied business and economic research including multiple regression, index numbers, time series analysis, forecasting models and methods, and sampling design.

241. *Public Finance.* I, II. 3 hr. PR: Econ. 51 or 55. Governmental fiscal organizations and policy; taxes and tax systems with particular emphasis on federal government and state of West Virginia.

245. *Government and Business.* I, II. 3 hr. PR: Econ. 51 or 55. Market structure, conduct and performance: analysis of the antitrust laws—judicial interpretation and effect on the business sector.

246. *Transportation Economics.* I. 3 hr. PR: Econ. 51 or 55. Economic and institutional analysis of the domestic transportation system of the United States. Topics include role of transportation, carrier characteristics and services, transportation rates and costs, regulation of transportation.

250. *International Economics.* I or II. 3 hr. PR: Econ. 51 or 55. Development of trade among nations; theories of trade; policies, physical factors, trends, and barriers in international economics.

255. *Regional Economics.* I. 3 hr. PR: Econ. 51 or 55. Analysis of the regional economy's spatial dimension, emphasizing interregional capital and labor mobility, the role of cities, objectives and issues of regional policy, lagging regions and Appalachia, growth poles, and regional growth and income distribution.

257. *Urban Economics.* II. 3 hr. PR: Econ. 51 or 55. Analysis of spatial dimensions of the urban economy, emphasizing both urban economic theory and urban policy. Issues include cities and income inequality, urban upgrading function, blight, economics of ghettos, the economies of urban size.

262. *Collective Bargaining.* I or II. 3 hr. PR: Econ. 160 or consent. Theory and practice of collective bargaining; including contract issues, types of relationships, and the role of government policy.

263. *Labor Market Analysis.* I or II. 3 hr. PR: Econ. 160 or consent. Determination of wage levels and structure; economic and institutional forces determining wage levels and differentials.

270. *Growth of the American Economy.* I or II. 3 hr. PR: Econ. 51 or 55. Central issues in the development of the American economy.

297. *Internship.* I, II, S. 1-12 hr. PR: Econ. 51 or 55 and departmental approval. Field experience in the analysis and solution of economic problems in the public and private sectors.

299. *Readings in Economics.* I, II, S. 1-3 hr. PR: Econ. 51 or 55. Students will develop and carry out a program of specialized readings under the supervision of a cooperating instructor.

English Language and Literature

Faculty

Elaine K. Ginsberg, Ph.D. (U. Okla.), *Chairperson and Associate Professor.*
Timothy Adams, Ph.D. (Emory U.), *Assistant Professor.*
Dennis Allen, Ph.D. (U. Minn.), *Assistant Professor.*
Rudolph P. Almasy, Ph.D. (U. Minn.), *Associate Professor.*
Joy U. Berkley, M.A. (WVU), *Assistant Professor.*
Sophia B. Blaydes, Ph.D. (Ind. U.), *Professor.*
Philip Bordinat, Ph.D. (U. Birmingham, Eng.), *Professor.*
J. P. Brawner, Ph.D. (U. Ill.), *Professor Emeritus.*
Arthur C. Buck, Ph.D. (U. Ark.), *Associate Professor.*
Robert W. Clarke, Ph.D. (U. Wisc.), *Associate Professor.*
Patrick Conner, Ph.D. (U. Md.), *Assistant Professor.*
Lloyd M. Davis, M.A. (Vanderbilt U.), *Associate Professor.*
Oreta H. Dawson, M.A. (WVU), *Associate Professor Emerita.*
Edna M. Dillon, M.A. (WVU), *Assistant Professor.*
Richard B. Eaton, Jr., Ph.D. (U. N.C.), *Associate Professor.*
Nicholas G. Ehle, Jr., M.A. (WVU), *Assistant Professor.*
Nicholas G. Evans, Ed.D. (WVU), *Assistant Professor; Assistant Dean, College of Arts and Sciences.*
David Farkas, Ph.D. (U. Minn.), *Assistant Professor.*
William P. Fitzpatrick, Ph.D. (U. Md.), *Associate Professor.*
John Flynn, D.A. (Carnegie-Mellon U.), *Assistant Professor.*
Ruel E. Foster, Ph.D. (Vanderbilt U.), *Claude Worthington Benedum Professor of American Literature.*
William W. French, Ph.D. (U. Pitt), *Associate Professor.*
Winston Fuller, M.A. (U. Colo.), *Assistant Professor.*
Jack W. Futrell, M.A. (Columbia U.), *Assistant Professor.*
Anita Gandolfo, Ph.D. (CUNY), *Assistant Professor.*
Avery F. Gaskins, Ph.D. (Ind. U.), *Associate Professor.*
W. Michael Grant, Ph.D. (Brown U.), *Associate Professor.*
Carolyn H. Hampson, M.A. (WVU), *Assistant Professor.*
John L. Hicks, Jr., M.A. (Ind. U.), *Professor Emeritus.*
Ellesa Clay High, Ph.D. (Ohio U.), *Assistant Professor.*
Martha C. Howard, M.A. (U. Mich.), *Associate Professor; Director, University Honors Program.*
Betty Jo Hypes, M.A. (WVU), *Assistant Professor.*
Iris M. Jennings M.A. (WVU), *Assistant Professor.*
John H. Johnston, Ph.D. (U. Wisc.), *Professor.*
Terry Lucas, M.A. (WVU), *Assistant Professor.*
Russell C. MacDonald, Ph.D. (U. Penn), *Associate Professor.*
Elizabeth Madison, Ph.D. (Ind. U.), *Assistant Professor.*
Thomas Miles, Ph.D. (SUNY), *Associate Professor.*
Byron C. Nelson, M.A. (U. Ill.), *Assistant Professor.*
Virgil L. Peterson, Ph.D. (UCLA), *Professor.*
John Racin, Jr., Ph.D. (Ohio St. U.), *Professor.*
Margaret Racin, M.A. (WVU), *Assistant Professor.*
Kathleen G. Rousseau, M.A. (WVU), *Assistant Professor.*
Frank Scafella, Jr., Ph.D. (U. Chicago), *Associate Professor.*
Dorothy Sedley, M.A. (Sonoma St. C.), *Assistant Professor.*
Aileen K. Shafer, M.A. (WVU), *Assistant Professor.*

Anna W. Shannon, Ph.D. (U. Nebr.), *Assistant Professor.*
Elizabeth C. Spindler, M.A. (WVU), *Associate Professor Emerita.*
John F. Stasny, M.A. (U. Minn.), *Professor.*
Judith G. Stitzel, Ph.D. (U. Minn.), *Professor.*
Myron C. Tuman, Ph.D. (Tulane U.), *Assistant Professor.*
Barry Ward, Ph.D. (Ohio St. U.), *Associate Professor.*
Hayden Ward, Ph.D. (Columbia U.), *Associate Professor.*
Jack Welch, D.A. (Carnegie-Mellon U.), *Associate Professor.*

Major in English

A student majoring in English begins with a basic knowledge of American and British literary history (Engl. 21, 22, 24, and 25) and at least one course in the formal study of language (Engl. 111, 113, 210, or 211). In addition to these five required courses, the student selects—usually at the 100 and 200 level—at least 18 additional hours of course work in the Department of English to match his or her interests and career objectives. The department offers a wide range of courses for students who intend to: (1) pursue a graduate degree in English; (2) attain certification for teaching English or Language Arts (comprehensive) in the secondary schools; (3) concentrate in literature and language as preparation for entrance into professional schools such as law, medicine, or dentistry; (4) concentrate in writing.

Because students have varied interests in studying literature, language, and/or writing, they are strongly urged to consult with the department's undergraduate adviser in planning their selection of course work. To aid students in their deliberations, the department has prepared a statement explaining special features of its curriculum (e.g., field experience, teaching practicum), informing students of the opportunity to double major, and suggesting course selections for students interested in, among other things: literary history; genre studies; language studies; creative writing; scientific/technical writing; Appalachian studies; women's studies; and graduate study in English.

Required Courses

Engl. 21, 22, 24, and 25. One course from the following: Engl. 111, 113, 210, 211. At least 18 additional hours of courses offered by the Department of English in literature, language, or writing. At least 9 hours of the student's total course work must be at the 200-level.

An English major must complete a minimum of 33 hours in literature, language, and writing, exclusive of Engl. 1 and 2. A major may have a maximum of 42 hours in English, exclusive of Engl. 1 and 2, within the 128 hours required for graduation.

Publications

The Department of English edits *Victorian Poetry*, the critical journal of Victorian literature established by WVU in 1963, which has become the internationally recognized scholarly journal in its field with subscribers in all 50 states and in 26 foreign countries.

Dialogue, a journal for all English teachers in West Virginia, is sponsored by the Department of English.

Eiderdown, a publication of WVU student writing, is also sponsored by the Department of English and the English Honorary and Club.

Archives of British History and Culture also is supported by the Department of English.

West Virginia Philological Papers, a publication dedicated to literary scholarship within the state, is co-sponsored by the Department of English.

Courses of Instruction in English Language and Literature (Engl.)

Courses in Writing: Engl. 1, 2, 8, 101, 102, 103, 104, 105, 106, 108, 201, 202, 208, 293, 295/391.

Courses in Language Studies: Engl. 111, 112, 113, 210, 211.

Courses in Literature: Engl. 21, 22, 24, 25, 35, 36, 40, 45, 80, 85, 125, 130, 131, 132, 133, 141, 143, 145, 150, 170, 171, 172, 175, 178, 180, 181, 183, 188, 220, 223, 232, 233, 234, 235, 236, 240, 241, 245, 250, 251, 255, 256, 261, 262, 263, 264, 265, 266, 267, 268, 280, 283, 286, 288, 294, 310, 311, 330, 331, 332, 334, 335, 336, 337, 340, 341, 345, 350, 356, 365, 366, 369, 370, 371, 372.

Special Offerings: Engl. 190, 191, 195, 197, 290, 392.

Lower Division

1. *Composition and Rhetoric.* I, II, S. 3 hr. Writing coherent paragraphs and expository essays in a clear and direct style without errors in usage and punctuation. Required of all bachelor's degree candidates unless the requirement is waived under regulations prevailing at the time of admission.

2. *Composition and Rhetoric.* I, II, S. 3 hr. PR: Engl. 1 or equiv. Writing college-level research papers based on argumentative models. Precision in footnotes, bibliographies, usage, punctuation, and stylistics assumed. Required of all bachelor's degree candidates unless the requirement is waived under regulations prevailing at the time of admission.

8. *Intermediate Composition.* I, II. 3 hr. PR: Engl. 1 and 2. Composition for students who wish to develop skills in solving problems of written communication relevant to their career objectives.

21. *British Literature.* I, II, S. 3 hr. A historical introduction and survey from the middle ages through the eighteenth century.

22. *British Literature.* I, II, S. 3 hr. A historical introduction and survey from the late eighteenth century to the present.

24. *American Literature.* I, II, S. 3 hr. A historical introduction and survey from its beginnings to the mid-nineteenth century.

25. *American Literature.* I, II, S. 3 hr. A historical introduction and survey from the mid-nineteenth century to the present.

35. *Poetry and Drama.* I, II, S. 3 hr. An introduction to the genres.

36. *Short Story and Novel.* I, II, S. 3 hr. An introduction to the genres.

40. *Introduction to Folklore.* I, II, S. 3 hr. Recognition, collection, and documentation of folklore materials.

45. *Appalachian Experience in Literature.* I, II, S. 3 hr. An introduction to the imaginative literature of the region.

80. *Literature of Black America.* I, II, S. 3 hr. A historical introduction and survey from its beginnings to the present.

85. *Contemporary African Literature.* I, II, S. 3 hr. A survey of contemporary African poetry, drama, and fiction.

Upper Division

101. *Creative Writing: Narration (Short Story).* I, II. 3 hr. Purpose and pattern of the modern short story; study of examples in the current periodicals; special assignments and conferences with individual students on a minimum number of short stories.

102. *Creative Writing: Fiction.* I, II. 3 hr. Workshop course for students to explore further their interests in writing fiction. Emphasis on studying the craft and analyzing the student's own work.

103. *Creative Writing: Poetry.* I, II. 3 hr. Practice in basic techniques of writing poetry. Possibilities and limitations of the poetic genre. Primary emphasis on image, metaphor, and development by association.

104. *Creative Writing: Poetic Forms.* I, II. 3 hr. Practice in the basic techniques of writing open and closed forms of poetry. Primary emphasis on rhythm, sound, tone, and voice.

105. *Business English.* I, II, S. 3 hr. PR: Engl. 1 and 2. *(Typing may be required.)* Assembling economic and commerical data, and writing business correspondence and reports; covers content, organization, style and conventions of grammar and usage.

106. *Journal Writing.* I, II. 3 hr. PR: Engl. 1 and 2 or equiv. Practice in writing a sequence of structured exercises designed to enhance creativity and awareness. Students also study the theories on which these exercises are based and apply them to the autobiographical writings of others.

108. *Advanced Composition.* I, II. 3 hr. PR: Engl. 1 and 2. Composition for students who wish to further develop their expository and argumentative writing skills.

111. *The English Language.* I, II, S. 3 hr. Study of the structure of contemporary English and how it works: the sound system and word-formation and sentence-formation systems and how they interact to create meaning.

112. *Words and Usage.* I, II. 3 hr. Practical vocabulary building, English grammar and usage. Attention to the derivation, history, and meaning of words, and to the principles of syntax and grammar.

113. *American English.* I, II. 3 hr. Historical survey of the development of American English from the time of colonization to the present. Attention to social, cultural, economic, and political forces that have influenced the development of American English. Emphasis on the Appalachian dialect.

125. *World Literature.* I, II. 3 hr. Selected readings in the works of authors of world literature both ancient and modern.

130. *Biography and Autobiography.* I, II. 3 hr. Biography and autobiography as a genre; representative works chosen for their literary value and their interest and relevance in contemporary life; figures in the arts, sciences, business, and public life.

131. *American Fiction.* I, II. 3 hr. Reading of short stories and novels by American authors of the nineteenth and twentieth centuries.

132. *Poetry.* I, II. 3 hr. Appreciation and enjoyment of poems through critical and analytical reading. Studies in the various types of poetry, and of the language, imagery, and techniques of poetic expression.

133. *The Short Story.* I, II. 3 hr. The short story's structure, history, and contemporary forms.

134. *Modern Drama.* I, II. 3 hr. World drama from Ibsen to the present.

141. *American Folklore and Culture.* I, II, S. 3 hr. PR: Engl. 40 or consent. Various aspects of folklore from the American Indian, early settlers, the American Negro, the immigrant, and occupational groups. Influence of folklore on American culture.

143. *Modern Continental Novel.* I, II. 3 hr. Discussion and analysis of continental novels of the twentieth century.

145. *Appalachian Fiction.* I, II, S. 3 hr. Reading of short stories, novels, and other narratives by Appalachian authors.

150. *Shakespeare.* I, II. 3 hr. Twelve of Shakespeare's most important plays.

170. *Modern Literature.* I. 3 hr. British and American poetry, drama, and fiction of the period from 1900 to 1930.

171. *Modern Literature.* II. 3 hr. Continuation of Engl. 170 from approximately 1930 to 1960.

172. *Contemporary Literature.* I, II, S. 3 hr. An examination of the significant literature written since 1960 in England and America. Poetry, drama, and fiction. Selections will vary depending on the instructor.

175. *Science Fiction and Fantasy.* I, II, S. 3 hr. A study of the history and nature of science fiction from H. G. Wells to the present, with special attention to those features of prose narration that science fiction shares with fantasy.

178. *Popular American Culture.* I. 3 hr. A survey of modern popular American culture from 1940 to the present with special emphasis on popular literature, music, television, movies, radio in its golden age, and comic books.

180. *Literature of the Old Testament.* I, II. 3 hr. Various types of literature exemplified in the Old Testament, read for their intrinsic merit and for their historical and cultural significance. Continued in Engl. 181.

181. *Literature of the New Testament.* I, II. 3 hr. Contents of the Old Testament Apocrypha and New Testament, their literary quality, with consideration of historical relations and of relationships of the several writers represented.

183. *Study of Selected Authors.* I, II, S. 3 hr. *(May be repeated with a change in course content for a maximum of 9 credit hours.)* Study of the works of one or more major authors.

186. *Black American Fiction.* I, II. 3 hr. Reading of novels and short stories written by black American authors from 1890 to the present.

188. *Images of Women in Literature.* I, II. 3 hr. Representative literary works studied against backdrop of social and historical documents to examine effect of images of women in literature on self-image of women today.

190. *Teaching Practicum.* I, II, S. 1-3 hr. Teaching practice as a tutor or assistant in composition, literature, or business English.

191. *Special Topics.* I, II. 1-6 hr. *(May be repeated with a change in course content for a maximum of 9 credit hours.)* Studies in literature, language, or writing. Topics vary from section to section.

195. *Field Experience.* I, II, S. 1-18 hr. *(No more than 18 hours of Engl. 195 may be counted toward the 128 hours required for the B.A. degree.)* PR: Departmental consent. Experiences in the practical application of skills appropriate to an English degree; typically, but not exclusively, internships in writing or research directed by faculty and a field supervisor.

197. *Honors Course.* I, II. 1-6 hr. *(May be repeated for a maximum of 9 credit hours.)* PR: Departmental consent. Independent reading and study. For students admitted to the Honors Program.

201. *Creating Writing Workshop: Fiction.* I, II. 3 hr. Advanced workshop in creative writing for students seriously engaged in writing fiction.

202. *Creative Writing Workshop: Poetry.* I, II. 3 hr. Advanced workshop in creative writing for students seriously engaged in the writing of a major group of poems.

208. *Scientific and Technical Writing.* I, II. 3 hr. PR: Engl. 1 and 2. Writing for scientific and technical professions. Descriptions of equipment and processes; reports and proposals; scientific experiments; interoffice communications; articles for trade and research journals.

210. *Structure of the English Language.* I, II. 3 hr. Historical, comparative, and descriptive grammar, together with an introduction to English linguistics.

211. *History of the English Language.* I, II. 3 hr. Study of the nature of the language; questions of origins, language families, development, relationships of English as one of the Indo-European languages. *(Course will not be offered in 1983-84.)*

220. *American Poetry.* I, II. 3 hr. Major American poets of the nineteenth and twentieth centuries. *(Course will not be offered in 1983-84.)*

223. *Modern American Poetics.* I, II. 3 hr. A close study of those poets who have shaped the aesthetics of contemporary American poetry.

232. *Literary Criticism.* I, II. 3 hr. Literary criticism from Aristotle to modern times.

235. *American Drama.* I, II. 3 hr. Representative American dramas and history of theatre in America. *(Course will not be offered in 1983-84.)*

236. *Tragedy.* I, II. 3 hr. Masterpieces of tragedy from Greek times to modern, with consideration of changing concepts of tragedy and of ethical and ideological values reflected in works of major tragic authors.

240. *Folk Literature.* I, II. 3 hr. The folk ballad, its origin, history, and literary significance, based on Child's collection and on American ballad collections.

241. *Folk Literature of the Southern Appalachian Region.* I, II. 3 hr. Traditional literature of the southern Appalachian region, including songs, prose, tales, languages, customs, based on material collected in the region—especially in West Virginia. *(Course will not be offered in 1983-84.)*

245. *Studies in Appalachian Literature.* I, II, S. 3 hr. Studies of authors, genres, themes, or topics in Appalachian literature. *(Course will not be offered in 1983-84.)*

250. *Shakespeare's Art.* I, II, S. 3 hr. Special studies in Shakespeare's tragedies, comedies, and/or history plays, with some attention given to his non-dramatic poetry. With emphases varying from year to year, studies may include textual, historical, critical, and dramaturgical-theatrical approaches.

255. *Chaucer.* I, II. 3 hr. Early poems, *Troilus and Criseyde,* and *The Canterbury Tales.* In addition to an understanding and appreciation of Chaucer's works, the student is expected to acquire an adequate knowledge of Chaucer's language. *(Course will not be offered in 1983-84.)*

256. *Milton.* I, II. 3 hr. All of Milton's poems and a few selected prose works.

261. *Sixteenth Century Prose and Poetry.* I, II. 3 hr. Studies from Caxton to Bacon, from Skelton to Shakespeare.

262. *Seventeenth Century Prose and Poetry.* I, II. 3 hr. Studies from Donne to Dryden. *(Course will not be offered in 1983-84.)*

263. *Literature of the Eighteenth Century.* I, II. 3 hr. Literature of the period 1660-1744 in relation to social, political, and religious movements of the time. *(Course will not be offered in 1983-84.)*

264. *Literature of the Eighteenth Century.* I, II. 3 hr. Continuation of Engl. 263, covering the latter half of the century. May be taken independently of Engl. 263.

265. *The Romantic Movement.* I, II. 3 hr. A survey of the works of the major British Romantic writers along with an introduction to works of scholarship in British Romanticism. *(Course will not be offered in 1983-84.)*

266. *American Romanticism*. I, II. 3 hr. Writings of Ralph Waldo Emerson, Henry David Thoreau, and Nathaniel Hawthorne. A study of relations of these men to the history of their own time; their contributions to American thought and art.

267. *Victorian Poetry*. I, II. 3 hr. Major Victorian poets—Tennyson, Browning, Arnold, Rossetti, Morris, Swinburne, Fitzgerald—and a few of the later Victorian poets.

268. *Modern British Poetry*. I, II. 3 hr. British poetry from 1880 to present, including the Decadents, Counter-Decadents, Hopkins, Housman, Hardy, the Georgians, the Imagists, World War I poets, Yeats, Eliot, the Auden Group, and post-World War II poets. *(Course will not be offered in 1983-84.)*

280. *Southern Writers*. I, II. 3 hr. Twentieth-century Southern essayists, poets, short-story writers, and novelists in relation to ideological background.

283. *Study of Selected Authors*. I, II. 3 hr. *(May be repeated with a change in course content for a maximum of 9 credit hours.)* Study of the works of one or more major authors.

288. *Women Writers in England and America*. I, II. 3 hr. Syllabus may vary from year to year to include women writers in a particular country, historical period, or genre; or writing on a particular theme. *(Course will not be offered in 1983-84.)*

290. *Independent Study*. I, II. 1-3 hr. *(With departmental consent, may be repeated for a maximum of 9 credit hours.)* PR: Departmental consent. Individual study of literary, linguistic, and writing problems.

293. *Practicum in Teaching Composition*. I. 1 hr. PR: Engl. 108, 295. Designed to give prospective English and language arts teachers supervised practical experiences in individual writing tutorials.

294. *Fiction for Adolescents*. II. 3 hr. Designed for prospective teachers of English and language arts. Course focuses on recent fiction for adolescents as well as on traditional literature appropriate to the needs, interests, and abilities of youth. Evaluative criteria emphasized.

295/391. *Approaches to Teaching Composition*. I. 3 hr. *(May not be taken for both undergraduate and graduate credit.)* Surveys attitudes toward and techniques of teaching writing in elementary and secondary schools. Provides frequent opportunities for students to write, to analyze their writing, and to experiment in class with methods of teaching writing.

310. *Old English 1*. I, II. 3 hr. Study of Anglo-Saxon with selected readings from the literature of the period.

311. *Old English 2*. I, II. 3 hr. PR: Engl. 310, *Beowulf* and other texts in Old English.

330. *Early English Drama*. I, II. 3 hr. Study of the medieval and early Tudor drama to the age of Shakespeare. *(Course will not be offered in 1983-84.)*

331. *Elizabethan Drama*. I, II. 3 hr. Study of dramas of Shakespeare's contemporaries and successors to the closing of the theatres in 1642. Includes Kyd, Marlowe, Jonson, Heywood, Chapman, Webster, Beaumont, and Fletcher.

332. *Restoration and Eighteenth Century Drama*. I, II. 3 hr. Comedy, tragedy, the heroic play, the drama of sensibility and the reaction against it: Etherege, Wycherley, Farquhar, Congreve, Vanbrugh, Dryden, Otway, Goldsmith, and Sheridan. *(Course will not be offered in 1983-84.)*

334. *Contemporary Drama*. I, II. 3 hr. Recent developments in the drama, with special attention to Miller, Williams, Sartre, Anouilh, Osborne, Pinter, Bolt, and the Absurdists. *(Content altered as new playwrights representing new developments come into prominence.)*

335. *The English Novel to the Time of Scott.* I, II. 3 hr. Study of the English novel from the sixteenth century to the time of Scott, showing the development of the novelistic art from early narrative beginnings.

336. *The English Novel, 1832-1900.* I, II. 3 hr. Continuation of Engl. 335. Development of the English novel from the early nineteenth century to the beginning of the twentieth century. *(Course will not be offered in 1983-84.)*

337. *The Modern Novel.* I, II. 3 hr. Twentieth-century novel, with emphasis on works of selected British novelists.

340. *The American Novel to 1915, 1.* I, II. 3 hr. History of the American novel, based on reading of ten to twelve novels, from the beginning to World War I. *(Course will not be offered in 1983-84.)*

341. *The American Novel, 2.* I, II. 3 hr. History of the American novel, based on readings of ten to twelve novels from World War I to the present.

345. *Appalachian Literature.* I, II, S. 3 hr. Intensive study of selected topics, works, and writers of Appalachia.

350. *Shakespeare.* I, II. 3 hr. Intensive study of selected plays. Special attention to textual problems and to language and poetic imagery, together with the history of Shakespearean criticism and scholarship. *(Course will not be offered in 1983-84.)*

356. *Romantic Poetry.* I, II. 3 hr. Reading and study of the works of selected poets of the British Romantic movement with emphasis on related criticism and scholarship. *(Course will not be offered in 1983-84.)*

365. *Victorian Prose.* I, II. 3 hr. Study of the nonfictional writings of the great Victorian prose critics: Carlyle, Ruskin, Arnold, Newman, Macaulay, Huxley, and Morris.

366. *English Literature, 1880-1918.* I, II. 3 hr. Study of the more important writers and literary movements of the late Victorian and the Edwardian periods; emphasis on Hardy, Housman, Hopkins, Henley, Pater, Gissing, Moore, Butler, and writers of the "Aesthetic Movement."

369. *American Literature to 1830.* I, II. 3 hr. The major genres and themes of American literature in the colonial and early national periods (1620-1830) with special attention to the cultural context of the literature.

370. *American Literature, 1830-1865.* I, II. 3 hr. The Romantic period in American literature, concentrating on Emerson, Thoreau, Poe, Hawthorne, and Melville.

371. *American Literature, 1865-1915.* I, II. 3 hr. The literature of transcendentalism, realism, and naturalism in America between the Civil War and World War I, concentrating on Whitman, Twain, James, Dickinson, Crane, Adams, and Dreiser. *(Course will not be offered in 1983-84.)*

372. *American Literature, 1915-Present.* I, II. 3 hr. American prose and poetry. *(Course will not be offered in 1983-84.)*

383. *Recent Literary Criticism.* I, II. 3 hr. Brief survey of theories of major schools of modern criticism and an application of these theories to selected literary works.

391 / 295. *Approaches to Teaching Composition.* I. 3 hr. *(May not be taken for both undergraduate and graduate credit.)* Surveys attitudes toward and techniques of teaching writing in elementary and secondary schools. Provides frequent opportunities for students to write, to analyze their writing, and to experiment in class with methods of teaching writing.

392. *Special Topics.* I, II, S. 1-9 hr. PR: Consent. Advanced study of special topics in language, literature, or writing.

Foreign Languages

Faculty

Robert J. Elkins, Ph.D. (U. Kans.), *Chairperson of Foreign Languages; Professor of German.*
Michel J. Beauchemin, M.A. (Brown U.), *Assistant Professor of Romance Languages.*
Marilyn Bendena, Ph.D. (Wayne St. U.), *Associate Professor of French.*
Laszlo A. Borsay, Ph.D. (U. Pitt), *Professor Emeritus.*
Axel Claesges, Ph.D. (Vanderbilt U.), *Associate Professor of German.*
Porter Conerly, Ph.D. (U. N.C.), *Assistant Professor of Romance Languages.*
Patricia Cummins, Ph.D. (U. N.C.), *Associate Professor of Romance Languages.*
Ronald W. Dunbar, Ph.D. (U. Wisc.), *Assistant Professor of German and Linguistics.*
Eleanor R. Gibbard, M.A. (WVU), *Associate Professor Emerita.*
John R. Goldberg, Ph.D. (U. Kans.), *Assistant Professor of French and Linguistics.*
Pablo Gonzalez, Ph.D. (U. Madrid), *Associate Professor of Spanish.*
Gary L. Harris, Ph.D. (Ohio St. U.), *Associate Professor of Russian.*
Luis Harss, M.A. (Stanford U.), *Associate Professor of Spanish.*
Francisco Herrera, M.A. (WVU), *Professor Emeritus.*
Lois Hinckley, Ph.D. (U. N.C.), *Assistant Professor of Classical Languages.*
Donald T. Huffman, M.A. (Ind. U.), *Assistant Professor of German.*
Victor J. Lemke, Ph.D. (U. Wisc.), *Professor Emeritus.*
Arthur C. McBride, Docteur de l'u de Bordeaux (U. Bordeaux), *Professor Emeritus.*
Kathleen McNerney, Ph.D. (U. N.M.), *Assistant Professor of Spanish.*
Warren F. Manning, Ph.D. (Harvard U.), *Professor Emeritus.*
Joseph A. Murphy, Ph.D. (Ohio St. U.), *Associate Professor of French.*
Jean-Pierre M. Ponchie, Ph.D. (Mich. St. U.), *Professor of French.*
Joseph J. Prentiss, Ph.D. (U. Pitt), *Associate Professor of Classical Languages.*
Michael E. Reider, Ph.D. (U. Iowa), *Assistant Professor of Spanish and Linguistics.*
Joseph F. Renahan, M.S. (Yeshiva U.), *Associate Professor of Romance Languages.*
Takeko Ruf, (Kinjo Wom. C.), *Lecturer in Japanese.*
Jurgen Schlunk, Ph.D. (U. Marburg), *Associate Professor of German.*
William L. Siemens, Ph.D. (U. Kans.), *Associate Professor of Spanish.*
Armand E. Singer, Ph.D. (Duke U.), *Professor Emeritus.*
Janice Spleth, Ph.D. (Rice U.), *Associate Professor of French.*
Robert Stilwell, Ph.D. (U. Tex.), *Professor Emeritus.*
Harley U. Taylor, Ph.D. (Ind. U.), *Professor of German; Associate Chairperson.*
Stanley Whitley, Ph.D. (Cornell U.), *Associate Professor of Spanish and Linguistics.*

Programs

The Department of Foreign Languages offers work in foreign languages, literatures, cultures, and in linguistics. Languages included are Arabic, Chinese, French, German, Greek, Hausa, Hebrew, Italian, Japanese, Latin, Polish, Portuguese, Russian, Spanish, and Swahili. Certain literature courses are taught in English and are known as FLIT (Foreign Literature in Translation) courses. Other areas are EFL (English As a Foreign Language), Linguistics, Language Teaching Methods, and Bibliography and Research. A student may be a candidate for a B.A. degree, with options in French, German, Russian, Spanish, Classics, Linguistics, Foreign Literature in Translation, and Teaching English As a Foreign Language.

A foreign language major must complete a minimum of 27 hours of upper-division work offered by the Department of Foreign Languages. Three of the hours must be Lingu. 111. Lang. 221 can not be counted toward the major. Twelve of the hours must be in one of the listed options:

Options: a. Frch. 103, 104, 109, 110.
b. Ger. 103, 104, 109, 110.
c. Span. 103, 104, 109, 110.
d. Russ. 103, 104, 109, 110.
e. Class. 109, 110, and any two upper-division classics courses approved by adviser.
f. Lingu. 202, 283, 284, plus one upper-division linguistics course approved by adviser.
g. Four upper-division FLIT courses approved by adviser.

All students majoring in foreign languages must present a minor consisting of 12 upper-division hours from within the department or from outside the department. The outside minor must be approved by the adviser. The departmental minor may not duplicate courses from the major. All 12 hours in the minor must have the same division prefix (i.e., German, Spanish, Linguistics, FLIT, etc.)

Students electing options a-f may not use FLIT courses to fulfill the major requirements but may use them for the minor requirement.

Students wishing teaching certification should inquire as to which courses fulfill certification requirements.

Students also should elect relevant courses in history, political science, humanities, English, journalism, geography, sociology and anthropology, and/or business and economics. Students electing the joint Foreign Language/Economics program should make this information available to the Chairperson of Foreign Languages at the earliest opportunity in order to enroll in the correct Economics courses.

The Department of Foreign Languages cooperates closely with several other departments in offering interdepartmental majors.

Note 1: The basic series of foreign language courses is divided into three levels: elementary, intermediate, and advanced. The elementary level, courses 1 and 2, provides beginning work in the four basic skills of the languages: understanding, speaking, reading, and writing, with emphasis on audio-lingual procedures. The vocabulary employed is limited to words of high frequency. Intermediate level, courses 3 and 4, provides further training in the four basic skills, with greater emphasis on reading. The vocabulary is greatly extended, especially the passive or recognition vocabulary. In courses 103, 104, 109 and 110, the four basic skills are further developed. All classroom questions and discussions are in the foreign language. The work is based on reading assignments followed by classroom discussions, oral drills, and written exercises.

Note 2: In French, German, and Spanish, alternate routes are offered at the intermediate level. Courses numbered 23 and 24 provide two semesters of work intended to develop a thorough reading knowledge. In them very little attention is given to pronunciation and none at all to other aspects of the oral skills.

Courses numbered 33 and 34 are taught in the target language. The major difference between them and those numbered 3 and 4 is in the choice of materials. Courses 3 and 4 use literary materials as a basis for discussion whereas courses 33 and 34 use cultural materials. Students who elect courses 33 and 34 may then continue in the normal 103-110 sequence.

Students can receive credit for only one of the courses 1 or 21; 2 or 22; 3, 23, or 33; 4, 24, or 34 in the same language.

Courses numbered 10 are intensive and are the equivalent of courses 1 and 2. Students may receive credit for either course 1 and 2 or 10 but not for both. Courses numbered 11 are the intensive equivalent of courses 3 and 4. Students may receive credit for courses 3 and 4 or 11 but not for both.

Note 3: Only students who seriously wish to learn Chinese, Hausa, Hebrew, Japanese, and Swahili are advised to enroll in them.

Note 4: Students who have studied a foreign language before may be eligible to begin at the intermediate or advanced levels. A placement test is administered during freshman orientation, the results of which indicate at which level the student should enroll. Students who have studied a language in high school may be able to obtain credit for such study by means of credit by examination.

Students who are beginning a language and have no special language preference should consider their personal and professional interests. They may desire a language that creates an awareness of their ethnic heritage (e.g., Italian, Polish, Hausa, Hebrew) or they may wish to consider career goals. The following suggestions are only guidelines and individuals should seek advice from members of the Department of Foreign Languages or from their major adviser. Physical Sciences: German, Russian; Pre-Medicine: Latin (for nomenclature), German or Russian (for research), Spanish (for U.S. practices); Social Sciences: Spanish, French; Political Science and History: the languages of the countries of interest; Mathematics and Philosophy: German, French; English: German, Latin, French; Psychology: German, Russian, French; Business and Economics: Spanish, Chinese, Japanese, German, French, Russian; Arts: Italian, French, Latin, German, Spanish; Mining and Engineering: German, Russian, and French.

Special Courses of Study Abroad

Courses in German have been offered in Germany during the summer, in Spanish in Spain and Colombia during the summer, and in French in Canada during the summer and in France during the fall, spring, and summer. Students participating in a summer program normally register for 6 semester hours of credit at WVU, but the work is conducted overseas. Those participating in a fall or spring semester abroad enroll for 15-18 semester hours of credit.

The Department of Foreign Languages will offer a spring semester in France in 1983-84 and plans to offer a summer session in Germany, in Canada, and in Spain in 1983 and 1984—contingent upon funding and faculty availability.

Courses of Instruction in Arabic (Arab.)

1. *Elementary Modern Standard Arabic.* I. 3 hr. Elementary modern standard Arabic.

2. *Elementary Modern Standard Arabic.* II. 3 hr. PR: Arabic 1. Continuation of Arabic 1.

3. *Intermediate Modern Standard Arabic.* I. 3 hr. PR: Arabic 1, 2 or equiv. Continuation of Arabic 2.

4. *Intermediate Modern Standard Arabic.* II. 3 hr. PR: Arabic 3 or consent. Continuation of Arabic 3.

Courses of Instruction in Chinese (Chin.)

1. *Elementary Chinese.* I. 3 hr.
2. *Elementary Chinese.* II. 3 hr. Continuation of Chin. 1.
3. *Intermediate Chinese.* I. 3 hr. PR: Chin. 1, 2 or equiv.
4. *Intermediate Chinese.* II. 3 hr. PR: Chin. 3 or equiv.

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

Courses of Instruction in Classics (Class.)

Lower Division

1. *Elementary Latin.* I. 3 hr.
2. *Elementary Latin.* II. 3 hr.
3. *Intermediate Latin.* I. 3 hr. PR: Class. 1 and 2, or two years of high school Latin.
4. *Cicero's Orations.* II. 3 hr. PR: Class. 3, or two years of high school Latin.

11. *Elementary Greek.* I. 3 hr.
12. *Elementary Greek.* II. 3 hr.
13. *Intermediate Greek.* I. 3 hr. PR: Class. 12. *(Course will not be offered in 1983-84.)*
14. *Intermediate Greek.* II. 3 hr. PR: Class. 13. *(Course will not be offered in 1983-84.)*

Upper Division

101. *Greek and Roman Civilization and Culture.* I. 3 hr.
102. *Greek and Roman Myths.* II. 3 hr.
109. *Selections from Roman Prose.* I. 3 hr. PR: Class. 3 and 4 or consent.
110. *Selections from Roman Poetry.* II. 3 hr. PR: Class. 4 and 109 or consent.
113. *Roman Biographers.* I. 3 hr. PR: Class. 3 and 4 or consent.
165. *Roman Public and Private Life.* II. 3 hr. *(Course will not be offered in 1983-84.)*
192. *Special Topics.* I, II. 3 hr. PR: Consent.
195. *Field Experience.* I, II, S. 1-18 hr.* PR: Consent.
201. *Roman Novelists.* I. (Alternate Years.) 3 hr. PR: Class. 109, 110, or consent.
202. *Roman Comedy.* II. (Alternate Years.) 3 hr. PR: Class. 109, 110, or consent.
235. *Roman Epic.* I. 3 hr. PR: Class. 109, 110, or equiv. *(Course will not be offered in 1983-84.)*
292. *Pro-Seminar in Latin or Greek Literature.* 1-6 hr.* PR: Consent. Special topics.

Courses of Instruction in English As a Foreign Language (EFL)

51. *Intermediate Conversational English.* I, II, S. 3 hr. This course will emphasize colloquial and idiomatic English expression, concentrating on listening comprehension and communicative skills. Does not satisfy the Engl. 1 and 2 requirement. *(Does not qualify for Core.)*

*Variable credit courses normally carry 3 hours of credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

52. *Advanced Conversational English.* I, II, S. 3 hr. PR: EFL 51 or consent. Continuation of EFL 51. Does not satisfy the Engl. 1 and 2 requirement. *(Does not qualify for Core.)*

53. *English Grammar and Composition.* I, II, S. 3 hr. For foreign students only. Review of basic principles of English grammar, introduction to reading techniques, introduction to principles of composition. Vocabulary, punctuation, and spelling. *(Does not satisfy the Engl. 1 and 2 requirement.) (Does not qualify for Core.)*

54. *Intermediate English Grammar and Composition.* I, II, S. 3 hr. PR: EFL 53 or consent. Continuation of EFL 53. For foreign students only. Does not satisfy the Engl. 1 and 2 requirement. *(Does not qualify for Core.)*

55. *Advanced English Grammar and Composition.* I, II, S. 3 hr. PR: Consent. For foreign students only. An introduction to the specific skills and vocabulary needed to communicate effectively in the student's chosen specialization. Focuses on problems peculiar to foreign students in their areas of study. *(Does not satisfy the Engl. 1 and 2 requirement.) (Does not qualify for Core.)*

195. *Field Experience.* I, II, S. 1-18 hr.* PR: Consent.

Courses of Instruction in Foreign Literature in Translation (FLIT)

111. *Italian Literature in Translation 1.* I. 3 hr. Selected Italian works from the twelfth century to the end of the eighteenth century. Readings and discussion in English.

112. *Italian Literature in Translation 2.* II. 3 hr. Selected Italian works from the nineteenth and the twentieth centuries. Readings and discussion in English.

121. *Latin Literature in Translation 1.* I. 3 hr. Survey of Latin literature in translation.

122. *Latin Literature in Translation 2.* II. 3 hr. Survey of Latin literature in translation.

131. *Greek Literature in Translation 1.* I. 3 hr. Survey of Greek literature in translation.

132. *Greek Literature in Translation 2.* II. 3 hr. Survey of Greek literature in translation.

141. *Spanish Literature in Translation 1.* I. 3 hr. Selected Spanish works from the twelfth century to the end of the eighteenth century. Readings and discussion in English.

142. *Spanish Literature in Translation 2.* II. 3 hr. Selected Spanish works from the nineteenth and the twentieth centuries. Readings and discussion in English.

151. *Spanish American Literature in Translation 1.* I. 3 hr. Selected Spanish American works from the sixteenth century to the end of the nineteenth century. Readings and discussion in English. *(Course will not be offered in 1983-84.)*

152. *Spanish American Literature in Translation 2.* II. 3 hr. Selected Spanish American works from the nineteenth and the twentieth centuries. Readings and discussion in English. *(Course will not be offered in 1983-84.)*

155. *Modern Hebrew Literature in Translation.* II. 3 hr. A survey course examining the literature and sociocultural content out of which it grew. From the Yiddish folk background of the ghetto, to the *Haskalah,* to the development of Israeli literature until the present.

161. *French Literature in Translation 1.* I. 3 hr. Selected French works from the Middle Ages to the end of the eighteenth century. Readings and discussion in English.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

162. *French Literature in Translation 2.* II. 3 hr. Selected French works from the beginning of the nineteenth century to the present. Readings and discussion in English.

171. *Brazilian Literature in Translation.* II, S. 3 hr. Survey of Brazilian literary masterworks in English translation concentrating heavily on prose forms (novel, novelette, short story, play) dating from the mid-nineteenth century. *(Course will not be offered in 1983-84.)*

181. *German Literature in Translation 1.* I. 3 hr. Selected German works from 800 A.D. to the period of Naturalism. Readings and discussion in English.

182. *German Literature in Translation 2.* II. 3 hr. Selected German works from the period of Naturalism to the present. Readings and discussion in English.

191. *Russian Literature in Translation 1.* I. 3 hr. Major works of Russian authors from the beginning to 1880, including those of Pushkin, Lermontov, Gogol, Turgenev, Dostoyevsky, and Tolstoy. Russian majors will read selections in the original.

192. *Russian Literature in Translation 2.* II. 3 hr. Continuation of FLIT 191. Major literature of Soviet Union from 1880 to the present. Russian majors will read selections in the original.

211. *Chinese Literature in Translation.* I. 3 hr. Survey of selected works of Chinese literature from ancient times through the eighteenth century.

221. *Japanese Literature in Translation.* II. 3 hr. Survey of selected works of Japanese literature from ancient period to the mid-nineteenth century and an introduction to a few works of the modern period.

292. *Pro-Seminar.* I, II, S. 1-6 hr.* PR: 6 hr. upper-division literature courses or consent. Special topics.

392. *Seminar.* I, II, S. 1-6 hr.* PR: 6 hr. upper-division literature courses or consent. Special topics.

Courses of Instruction in French (Frch.)

Lower Division

1. *Elementary French.* I, II. 3 hr.

2. *Elementary French.* I, II. 3 hr. Continuation of Frch. 1.

3. *Intermediate French.* I, II. 3 hr. PR: Frch. 1, 2, or equiv.

4. *Intermediate French.* I, II. 3 hr. PR: Frch. 3 or consent. Continuation of Frch. 3.

10. *Intensive Elementary French.* I. 6 hr. The equivalent of French 1 and 2 combined into one course.

11. *Intensive Intermediate French.* II. 6 hr. PR: Frch. 1 and 2 or 10 or consent. The equivalent of Frch. 3 and 4 combined into one course.

21. *Elementary French: Reading.* I. 3 hr. Beginning French with concentration on reading comprehension.

22. *Elementary French: Reading.* II. 3 hr. PR: Frch. 21 or equiv. Continuation of Frch. 21.

23. *Intermediate French: Reading.* I. 3 hr. PR: Frch. 21, 22, or equiv.

24. *Intermediate French: Reading.* II. 3 hr. PR: Frch. 23 or equiv. Continuation of Frch. 23.

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

33. *Intermediate French: Cultural Emphasis.* I. 3 hr. PR: Frch. 1 and 2, or equiv.

34. *Intermediate French: Cultural Emphasis.* II. 3 hr. PR: Frch. 3, 33, or equiv. Continuation of Frch. 33.

Upper Division

101. *Commercial French.* I. 3 hr. PR: Frch. 4 or equiv. Introduction to the use of the French language in French business practices, letterwriting, and the study of economic geography.

102. *Advanced Commercial French.* II. 3 hr. PR: Frch. 101 or consent. Continuation of Frch. 101; preparation for international examination of Paris Chamber of Commerce.

103. *Advanced French.* I. 3 hr. PR: Frch. 3, 4, consent.

104. *Advanced French.* II. 3 hr. PR: Frch. 103 or consent.

109. *Advanced French.* I. 3 hr. PR: Frch. 104 or consent.

110. *Advanced French.* II. 3 hr. PR: Frch. 109 or consent.

111. *French Literature from the Middle Ages to the Eighteenth Century.* I. 3 hr. PR: Two years of college French or equiv. or consent.

112. *French Literature from the Eighteenth Century to the Contemporary Period.* II. 3 hr. PR: Two years of college French or equiv. or consent.

115. *The Classical School.* I. 3 hr. PR: 12 hr. of French or equiv.

118. *Literature of the Nineteenth Century.* I. 3 hr. PR: 12 hr. of French or equiv.

191. *Special Topics.* I, II, S. 1-4 hr.* PR: Consent.

203. *Conversational French.* I. 3 hr. PR: Frch. 110 or consent. Intensive spoken French.

217. *French Civilization.* II. 3 hr. PR: 12 hr. of French.

221. *The Romantic Movement.* I. 3 hr. PR: 18 hr. of French or consent.

222. *French Realism.* II. 3 hr. PR: 18 hr. of French or consent.

229. *Literature of the Sixteenth Century.* I. 3 hr. PR: 18 hr. of French or consent. *(Course will not be offered in 1983-84.)*

231. *Phonetics and Pronunciation.* II. 3 hr. PR: 12 hr. of French or equiv.

292. *Pro-Seminar.* I, II, S. 1-6 hr.* PR: 18 hr. of French or consent. Special topics.

305. *Fundamentals for Reading French.* I. 3 hr. PR: Graduate or upper-division standing. *(Frch. 305 and 306 is intended for graduate students from other departments to teach them to read general and technical French.)*

306. *Reading French.* II. 3 hr. PR: 12 hr. of French or equiv. or Frch. 305. *(Graduate students may meet a doctoral foreign language requirement by achieving a grade of B or better in this course.)*

326. *Literary Criticism.* II. 3 hr. PR: B.A. in French or consent.

337. *Moliere.* II. 3 hr. PR: B.A. in French or consent.

344. *Explication de Textes.* II. 3 hr. PR: 24 hr. of French or equiv. *(Course will not be offered in 1983-84.)*

371. *The Modern Novel to 1930.* I. 3 hr. PR: B.A. in French or consent.

*Variable credit courses normally carry 3 hours of credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

372. *The Novel After 1930.* II. 3 hr. PR: B.A. in French or consent.

381. *Medieval French Literature.* II. 3 hr. PR: Lingu. 343. *(Course will not be offered in 1983-84.)*

392. *Seminar.* 1-6 hr.* PR: Consent. Special topics.

Courses of Instruction in German (Ger.)

Lower Division

1. *Elementary German.* I, II. 3 hr.

2. *Elementary German.* I, II. 3 hr.

3. *Intermediate German.* I, II. 3 hr. PR: Ger. 1 and 2, or equiv.

4. *Intermediate German.* I, II. 3 hr. PR: Ger. 3, or consent. Continuation of Ger. 3.

10. *Intensive Elementary German.* I. 6 hr. The equivalent of Ger. 1 and 2 combined into one course.

11. *Intensive Intermediate German.* II. 6 hr. PR: Ger. 1 and 2 or 10 or consent. The equivalent of Ger. 3 and 4 combined into one course.

23. *Intermediate German: Reading.* I. 3 hr. PR: Ger. 1 and 2, or equiv.

24. *Intermediate German: Reading.* II. 3 hr. PR: Ger. 3, 23, or equiv. Continuation of Ger. 23.

33. *Intermediate German: Cultural Emphasis.* I. 3 hr. PR: Ger. 1 and 2, or equiv.

34. *Intermediate German: Cultural Emphasis.* II. 3 hr. PR: Ger. 3, 33, or equiv. Continuation of Ger. 33.

Upper Division

103. *Advanced German.* I. 3 hr. PR: Ger. 3, 4, or consent.

104. *Advanced German.* II. 3 hr. PR: Ger. 103 or consent.

109. *Advanced German.* I. 3 hr. PR: Ger. 104 or consent. Continuation of the four basic skills.

110. *Advanced German.* II. 3 hr. PR: Ger. 109 or consent.

111. *German Literature to 1832.* I. 3 hr. PR: Ger. 4 or equiv. Readings and discussions of German literature from its earliest beginning until 1832. Representative selections from each major period will be read.

112. *German Literature Since 1832.* II. 3 hr. PR: Ger. 4 or equiv. Readings and discussions of German literature from 1832 to the present time. Representative selections from each major period will be read.

121. *Scientific German.* I. 3 hr. PR: Ger. 1, 2. Primarily for students in science courses.

122. *Scientific German.* II. 3 hr. PR: Continuation of Ger. 121.

131. *German Civilization.* II. 3 hr. PR: Ger. 4 or consent. A study of contemporary German institutions, customs, and society.

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

195. *Field Experience.* I, II, S. 1-18 hr.* PR: Consent.

243. *Medieval German Literature.* I. 3 hr. PR: 18 hr. of German or consent. *(Course will not be offered in 1983-84.)*

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

245. *Classicism and Romanticism*. I. 3 hr. PR: 18 hr. of German or consent. Critical study of German literature from 1750 to 1830.

246. *The Liberal Age*. II. 3 hr. PR: 18 hr. of German or consent. Critical study of German literature from 1830 to 1880.

247. *The Age of Crisis*. I. 3 hr. PR: 18 hr. of German or consent. A critical study of German literature from 1880 to present.

292. *Pro-Seminar*. 1-6 hr.* PR: Consent. Special topics.

301. *Independent Reading*. I. 3 hr. PR: Consent. Supervised reading for students who wish to do intensive work in any field of interest.

302. *Independent Reading*. II. 3 hr. PR: Ger. 301. Continuation of Ger. 301.

305. *Fundamentals of Reading German*. I. 3 hr. PR: Graduate status or upper-division standing. *(Ger. 305-306 is intended for graduate students from other departments to teach them to read general and technical German.)*

306. *Reading German*. II. 3 hr. PR: 12 hr. of German or equiv., or Ger. 305. *(Graduate students may meet a doctoral foreign language requirement by achieving a grade of B or better in this course.)*

361. *Lyric Poetry*. I. 3 hr. PR: 24 hr. of German, or consent.

376. *The Modern Novel*. I, II. 3 hr. PR: 24 hr. of German or consent. A study of representative modern novels from 1900 to 1945.

392. *Seminar*. 1-6 hr.* PR: Graduate standing or consent. Special topics.

Courses of Instruction in Hausa (Hausa)

1. *Elementary Hausa*. I. 3 hr.

2. *Elementary Hausa*. II. 3 hr. Continuation of Hausa 1.

3. *Intermediate Hausa*. I. 3 hr. PR: Hausa 1, 2 or equiv.

4. *Intermediate Hausa*. II. 3 hr. PR: Hausa 3 or equiv.

Courses of Instruction in Hebrew (Hebrw.)

1. *Elementary Modern Hebrew*. I. 3 hr.

2. *Elementary Modern Hebrew*. II. 3 hr. Continuation of Hebrw. 1.

3. *Intermediate Hebrew*. I. 3 hr. PR: Hebrw. 1, 2 or equiv.

4. *Intermediate Hebrew*. II. 3 hr. PR: Hebrw. 3 or equiv.

191. *Special Topics*. I, II. 1-4 hr.* PR: Consent.

Courses of Instruction in Italian (Ital.)

1. *Elementary Italian*. I. 3 hr.

2. *Elementary Italian*. II. 3 hr. Continuation of Ital. 1.

3. *Intermediate Italian*. I. 3 hr. PR: Ital. 1, 2, or equiv.

4. *Intermediate Italian*. II. 3 hr. PR: Ital. 3 or consent. Continuation of Ital. 3.

109. *Composition and Conversation*. I. 3 hr. PR: Ital. 4 or consent.

*Variable credit courses normally carry 3 hours of credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

110. *Advanced Conversation.* II. 3 hr. PR: Ital. 4 or consent.

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

195. *Field Experience.* I, II, S. 1-18 hr.* PR: Consent.

Courses of Instruction in Japanese (Japan.)

1. *Elementary Japanese.* I. 3 hr.

2. *Elementary Japanese.* II. 3 hr. Continuation of Japan. 1.

3. *Intermediate Japanese.* I. 3 hr. PR: Japan. 1, 2 or equiv.

4. *Intermediate Japanese.* II. 3 hr. PR: Japan. 3 or equiv.

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

Courses of Instruction in Language Teaching Methods (Lang.)

Upper Division

191. *Special Topics.* I, II, S. 1-4 hr.* PR: Consent.

195. *Field Experience.* I, II, S. 1-18 hr.* PR: Consent.

221. *The Teaching of Foreign Languages.* I. 3 hr. PR: Consent. Required of all students who are prospective foreign language teachers on the secondary level.

292. *Pro-Seminar.* I, II, S. 1-6 hr.* PR: Consent. Special topics.

392. *Seminar.* I, II, S. 1-6 hr.* PR: Consent. Special topics.

Courses of Instruction in Linguistics (Lingu.)

Lower Division

1. *Introduction to Language.* I, II, S. 3 hr. General introduction to the nature of human language—its sounds, structure, mechanisms, and forms (oral/sign); its evolution and variation, how it is learned and stored, and how it differs from animal communications systems.

2. *Introduction to Language.* I, II, S. 3 hr. Introduction to the different languages of the world. Oral and written communications.

3. *Introduction to Language Comparison.* I. 3 hr. *(No previous language experience required.)* Comparison of various Indo-European languages.

111. *Introduction to Structural Linguistics.* I, II. 3 hr. Required for foreign language majors.

Upper Division

191. *Special Topics.* I, II, S. 1-4 hr.* PR: Consent.

202. *Phonology.* I. 3 hr. PR: Lingu. 1, 111 or consent. Description of sounds and sound systems in language. Articulatory phonetics. Structuralist and generative approaches to phonemics.

217. *Structure of Spanish.* I. 3 hr. PR: 18 hr. of Spanish and Lingu. 111 or consent. Description of the phonological or grammatical systems of Spanish, with emphasis on contrastive analysis (Spanish/English) and applied linguistics.

247. *Structure of Modern French.* I. 3 hr. PR: 18 hr. of French and Lingu. 111 or consent. Study of phonology, morphology, and syntax of modern French together with a contrastive analysis of French and English.

*Variable credit courses normally carry 3 hours of credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

257. *Structure of German.* II. 3 hr. PR: 18 hr. of German and Lingu. 111 or consent. Phonological, morphological, and syntactical structure of contemporary German language.

267. *Structure of Russian.* II. 3 hr. PR: 18 hr. of Russian and Lingu. 111 or consent. Phonological, morphological, and syntactical structure of contemporary Russian.

283. *Transformational Grammar.* S. 3 hr. PR: Lingu. 111 and consent. Emphasis on generative syntax in English, German, Romance, and Slavic languages.

284. *History of Linguistics.* I. 3 hr. PR: Lingu. 111 or consent. Development of linguistics from Greeks and Romans to contemporary researchers with concentration on major linguists and schools of the nineteenth and twentieth centuries.

287. *Psycholinguistics.* I. 3 hr. PR: Lingu. 111 or consent. Provides an insight into the many areas of psycholinguistic study, including language acquisition, sentence processing, animal communication, dichotic listening, aphasia, and semantics.

288. *Dialectology.* I. 3 hr. PR: Lingu. 1, 111 or consent. Introduction to the linguistic study of geographical and social variation in language.

292. *Pro-Seminar.* 1-6 hr.* PR: Consent. Special topics.

313. *History of the Spanish Language.* II. (Alternate Years.) 3 hr. PR: 18 hr. of Spanish and Lingu. 111 or consent. Evolution of Castilian from Vulgar Latin to its modern standard form through a study of historical phonology, morphology, and syntax, together with the external factors which influenced the development of the language.

313. *Old Spanish.* II. 3 hr. PR: Consent.

341. *History of the French Language.* II. (Alternate Years.) 3 hr. PR: 18 hr. of French and Lingu. 111 or consent. Evolution of French from Vulgar Latin into the Modern French standard through a study of historical phonology, morphology, and syntax together with the external factors which influenced the development of the language.

343. *Old French.* I. 3 hr. PR: Consent. Study of the oldest monuments of the French language including the Chanson de Roland and Aucassin et Nicolette in an effort to trace the evolution of Francien, Anglo-Norman, and Picard from Vulgar Latin.

351. *History of the German Language.* II. (Alternate Years.) 3 hr. PR: 18 hr. of German and Lingu. 111 or consent. Historical development of standard German with emphasis on its relationship to the other German languages and dialects.

353. *Middle High German 1.* I. 3 hr. PR: 18 hr. of German and Lingu. 111 or consent. Study of the linguistic developments of Middle High German from the eleventh to the fifteenth centuries with illustrative reading from the Neibelungenlied.

354. *Middle High German 2.* II. 3 hr. PR: Lingu. 353. Continuation of Lingu. 353 with illustrative readings from the Middle High German lyric poets and the courtly epics.

361. *History of the Russian Language.* II. (Alternate Years.) 3 hr. PR: 18 hr. of Russian and Lingu. 111 or consent. Development of Russian from Indo-European to the present.

392. *Seminar.* 1-6 hr.* Special topics. PR: Consent.

*Variable credit courses normally carry 3 hours of credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

Courses of Instruction in Polish (Polsh.)

1. *Elementary Polish.* I. 3 hr.
2. *Elementary Polish.* II. 3 hr. PR: Polsh. 1. Continuation of Polsh. 1.

Courses of Instruction in Portuguese (Port.)

1. *Elementary Portuguese.* I. 3 hr.
2. *Elementary Portuguese.* II. 3 hr.
3. *Intermediate Portuguese.* I. 3 hr. PR: Port. 1, 2, or equiv.
4. *Intermediate Portuguese.* II. 3 hr. PR: Port. 3 or equiv.

Courses of Instruction in Russian (Russ.)

Lower Division

1. *Elementary Russian.* I. 3 hr.
2. *Elementary Russian.* II. 3 hr. Continuation of Russ. 1.
3. *Intermediate Russian.* I. 3 hr. PR: Russ. 1, 2, or equiv.
4. *Intermediate Russian.* II. 3 hr. PR: Russ. 3 or consent. Continuation of Russ. 3.

Upper Division

103. *Advanced Russian.* I. 3 hr. PR: Russ. 3, 4, or consent.
104. *Advanced Russian.* II. 3 hr. PR: Russ. 103 or consent.
105. *The Russian Short Story.* I. 3 hr. PR: 12 hr. of Russian or equiv.
106. *The Russian Short Story.* II. 3 hr. PR: 12 hr. of Russian or equiv. Continuation of Russ. 105.
109. *Advanced Russian.* I. 3 hr. PR: Russ. 104 or consent.
110. *Advanced Russian.* II. 3 hr. PR: Russ. 109 or consent.
144. *Survey of Russian Literature.* I. 3 hr. PR: Russ. 3, 4, or consent.
145. *Survey of Russian Literature.* II. 3 hr. PR: Russ. 144. Continuation of Russ. 144.
292. *Pro-Seminar.* I, II. 1-6 hr.* PR: 18 hr. of Russian or equiv.
305. *Reading Russian.* I. 3 hr. PR: Graduate or upper-division standing. *(Russ. 305-306 is intended for graduate students from other departments to teach them to read general and technical Russian.)*
306. *Reading Russian.* II. 3 hr. PR: 12 hr. of Russian or equiv. or Russ. 305. *(Graduate students may meet the doctoral foreign language requirements by achieving a grade of B or better in this course.)*

Courses of Instruction in Spanish (Span.)

Lower Division

1. *Elementary Spanish.* I, II. 3 hr.
2. *Elementary Spanish.* I, II. 3 hr. Continuation of Span. 1.
3. *Intermediate Spanish.* I, II. 3 hr. PR: Span. 1, 2, or equiv.
4. *Intermediate Spanish.* I, II. 3 hr. PR: Span. 3 or consent. Continuation of Span. 3.

*Variable credit courses normally carry 3 hours of credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

10. *Intensive Elementary Spanish.* I. 6 hr. The equivalent of Span. 1 and 2 combined into one course.

11. *Intensive Intermediate Spanish.* II. 6 hr. PR: Span. 1 and 2 or 10 or consent. The equivalent of Span. 3 and 4 combined into one course.

23. *Intermediate Spanish: Reading.* I. 3 hr. PR: Span. 1 and 2 or equiv. Intermediate Spanish with concentration on reading comprehension. *(Course will not be offered in 1983-84.)*

24. *Intermediate Spanish: Reading.* I, II. 3 hr. PR: Span. 1, 2, and 3 or Span. 23 or equiv. Continuation of Span. 23. *(Course will not be offered in 1983-84.)*

33. *Intermediate Spanish: Cultural Emphasis.* I. 3 hr. PR: Span. 2 or equiv.

34. *Intermediate Spanish: Cultural Emphasis.* II. 3 hr. PR: Span. 3 or equiv. Continuation of Span. 33.

Upper Division

103. *Advanced Spanish.* I. 3 hr. PR: Span. 3, 4, or consent.

104. *Advanced Spanish.* II. 3 hr. PR: Span. 103 or consent.

109. *Advanced Spanish.* I. 3 hr. PR: Span. 104 or consent.

110. *Advanced Spanish.* II. 3 hr. PR: Span. 109 or consent.

116. *Civilization and Culture.* I. 3 hr. PR: 12 hr. of Spanish or equiv.

117. *Spanish-American Literature.* I. 3 hr. PR: 12 hr. of Spanish or equiv.

118. *Spanish-American Literature.* II. 3 hr. PR: 12 hr. of Spanish or equiv.

121. *Peninsular Literature Before 1800.* I. 3 hr. PR: Span. 3 and 4, or equiv., and preferably Span. 109. Reading and discussion of selections from representative works from the beginning of Spanish literature to the end of the eighteenth century together with an examination of those cultural factors which influenced the literature.

122. *Peninsular Literature Since 1800.* II. 3 hr. PR: Span. 3 and 4, or equiv., and preferably Span. 109. Readings in Spanish Peninsular literature of the Romantic, Realistic, and Naturalistic schools of the nineteenth century, the Generation of '98, and the various twenthieth-century writers down to the present day.

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

221. *Golden Age Literature.* II. 3 hr. PR: 24 hr. of Spanish or consent. Consideration of Spanish literature of the Renaissance and the Counter Reformation with readings in the novel, the comedia, and lyric poetry.

223. *Estudios de Estilo.* I. 3 hr. PR: 18 hr. of Spanish or equiv.

292. *Pro-Seminar.* 1-6 hr.* PR: Consent. Special topics.

315. *Lyric Poetry.* I. 3 hr. PR: 24 hr. of Spanish or equiv.

324. *Explicacion de Textos.* II. 3 hr. PR: 24 hr. of Spanish or equiv.

325. *The Picaresque Novel.* I. 3 hr. PR: 24 hr. of Spanish or equiv.

391. *Cervantes.* II. 3 hr. PR: 24 hr. of Spanish or consent. *(Course will not be offered in 1983-84.)*

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

392. *Seminar.* 1-6 hr.* PR: Consent. Special topics.

395. *Sixteenth Century Literature.* I. 3 hr. PR: B.A. in Spanish or consent.

Courses of Instruction in Swahili (Swah.)

1. *Beginning Swahili.* I. 3 hr.

2. *Beginning Swahili.* II. 3 hr. PR: Swah. 1. Continuation of Swah. 1.

3. *Intermediate Swahili.* I. 3 hr. PR: Swah. 1, 2, or equiv.

4. *Intermediate Swahili.* II. 3 hr. PR: Swah. 3 or equiv.

191. *Special Topics.* I, II. 1-4 hr.* PR: Consent.

Geology and Geography

Faculty

Alan C. Donaldson, Ph.D. (Penn St. U.), *Chairperson; Professor of Geology.*
Mary C. Behling, M.S. (Miami U., Oh.), *Adjunct Associate Professor of Geology.*
Robert E. Behling, Ph.D. (Ohio St. U.), *Professor of Geology.*
Frank J. Calzonetti, Ph.D. (U. Okla.), *Assistant Professor of Geography.*
Ping-fan Chen, Ph.D. (V.P.I.), *Adjunct Professor of Geology.*
Chester L. Dodson, M.S. (WVU), *Assistant Professor of Geology.*
William M. Dunne, Ph.D. (U. Bristol), *Assistant Professor of Geology.*
Gregory A. Elmes, Ph.D. (Penn St. U.), *Assistant Professor of Geography.*
Robert B. Erwin, Ph.D. (Cornell U.), *Professor of Geology.*
William H. Gillespie, M.S. (WVU), *Adjunct Professor of Geology.*
William C. Grady, M.S. (WVU), *Adjunct Assistant Professor of Geology.*
Robert Q. Hanham, Ph.D. (Ohio St. U.), *Associate Professor of Geography.*
Milton T. Heald, Ph.D. (Harvard U.), *Associate Chairperson; Professor of Geology.*
Michael E. Hohn, Ph.D. (Ind. U.), *Assistant Professor of Geology.*
Thomas W. Kammer, Ph.D. (Ind. U.), *Assistant Professor of Geology.*
Peter Lessing, Ph.D. (Syracuse U.), *Adjunct Professor of Geology.*
Richard S. Little, Ph.D. (Syracuse U.), *Associate Professor of Geography.*
John C. Ludlum, Ph.D. (Cornell U.), *Professor Emeritus of Geology.*
Kenneth C. Martis, Ph.D. (U. Mich.), *Associate Professor of Geography.*
William K. Overbey, B.S. (WVU), *Adjunct Associate Professor of Geology.*
Douglas G. Patchen, Ph.D. (Syracuse U.), *Adjunct Associate Professor of Geology.*
Dennis A. Poluga, M.A. (Ohio St. U.), *Adjunct Assistant Professor of Geography.*
Paul W. Queen, M.A. (WVU), *Adjunct Assistant Professor of Geology.*
Henry W. Rauch, Ph.D. (Penn St. U.), *Associate Professor of Geology.*
James P. Reger, Ph.D. (WVU), *Visiting Assistant Professor of Geology.*
John J. Renton, Ph.D. (WVU), *Professor of Geology.*
Graham D. Rowles, Ph.D. (Clark U.), *Assistant Chairperson; Associate Professor of Geography.*
Ruth A. Rowles, M.A. (U. Wisc.), *Adjunct Assistant Professor of Geography.*
Jay S. Sanders, M.A. (U. Penn), *Adjunct Assistant Professor of Geography.*
Robert C. Shumaker, Ph.D. (Cornell U.), *Professor of Geology.*
Carl J. Smith, M.S. (Ind. U.), *Adjunct Assistant Professor of Geology.*
Richard Smosna, Ph.D. (U. Ill.), *Associate Professor of Geology.*
Francis T. C. Ting, Ph.D. (Penn St. U.), *Professor of Geology.*
Dana Wells, Ph.D. (Columbia U.), *Professor Emeritus of Geology.*

*Variable credit courses normally carry 3 hours credit. Exceptions are made only in emergencies and must be approved by the Department Chairperson and the professor teaching the course.

Bachelor of Science in Geology

The Bachelor of Science degree is designed for students who want to qualify for professional positions in industry and government services, as well as those who plan to do graduate work in geology. A total of 134 hours is required, of which a minimum of 124 hours must be established in subjects exclusive of credits earned in Physical Education and Math. 2. Electives must be chosen so as to meet the basic requirements of the College of Arts and Sciences.

Admission to the program requires at least a cumulative average of 2.25 and an average of at least 2.25 in lower-division required geology courses. To continue in the program, an average of at least 2.0 must be maintained in required chemistry, physics, mathematics, and statistics courses. At least a 2.0 average must also be maintained in required upper-division geology courses.

Candidates for the Bachelor of Science in geology are required to take a total of 40 hours of geology courses. Students are urged to elect some supporting courses in such fields as mining or petroleum engineering, biology, geography, soil mechanics, pedology, and computer science, depending on their major field of geologic studies. Students planning to attend graduate school or seek employment in the oil industry should complete a full year of calculus. A total of 44 hours of non-geology electives are required of which 24 hours are needed to fulfill the University Core Curriculum; the balance can be in cognate fields and electives of general interest to the student, with the adviser's consent.

Instructional facilities and equipment include the laboratories associated with mineralogy, petrology, geochemistry, sedimentology, paleontology, geomorphology, mineral and fuel resources, and structural geology. Field studies are stressed with geologic mapping at Camp Wood in Greenbrier County; carbonate sediments and their depositional environments in the Florida Keys; sedimentation and coastal processes on the eastern shore of Virginia; pollution measurements in nearby streams and lakes; field trips to glaciated areas; examinations of processes acting on earth's surface in West Virginia; and structural and stratigraphic analyses of the Appalachian basin and orogenic belt. Subsurface logs and samples are available for study in the West Virginia Geological and Economic Survey and the nearby Morgantown Energy Technology Center of the U.S. Department of Energy.

Bachelor of Arts in Geology

The course requirements for the Bachelor of Arts with a major in geology are designed for students who want to go into careers that require a good background in the basic principles of geology. Areas such as environmental science, planning, or other earth-related sciences, secondary school teaching, or earth science laboratory technical work may be pursued by proper choice of electives.

Admission to the program requires at least a cumulative average of 2.25 and an average of at least 2.25 in lower-division required geology courses. To continue in the program, an average of at least 2.0 must be maintained in required chemistry, physics, mathematics, and statistics courses. At least a 2.0 average must also be maintained in required upper-division geology courses.

Major in Geology—B.S.

Required Courses

Geol. 1 or 5, 2, 3, 4, 152, 184, 185, 221, 231, 261, 266, and 4 to 8 hours of geology electives; Chem. 15 and 16; Phys. 1 and 2 or 11 and 12; Math. 3, 4, 15, and 16 or Stat. 212 or 231; Stat. 101.

Recommended Electives

Geol. 127, 228, 235, 270, 272, 274; Geog. 105, 107; C.S. 1; C.E. 1; additional biology, chemistry, physics, or mathematics courses.

Major in Geology—B.A.

Required Courses

Geol. 1 or 5, 2, 3, 4, 127, 152, 184, 221, or 222, 231 or 235, 261; Chem. 15 and 16; Phys. 1 and 2; Math. 3 and 4; advanced science elective other than geology.

Recommended Electives

See those listed under "Major in Geology—B.S."

Courses of Instruction in Geology (Geol.)

Lower Division

1. *Physical Geology.* I, II, S. 3 hr. *(Credit cannot be obtained for both Geol. 1 and Geol. 5.)* Description of composition and structure of earth physical processes which change earth's surface. Geol. 2 not required with Geol. 1. Registration in Geol. 2 meets requirements for 4 hr. credit in a laboratory science in physical geology.

2. *Physical Geology Laboratory.* I, II, S. 1 hr. PR or Conc.: Geol. 1.

3. *Historical Geology.* I, II, S. 3 hr. PR: Geol. 1 or Geol. 5 or Conc. with consent. Evolution of earth and its inhabitants. *(Accompanied by Geol. 4 to meet requirements of 4 hr. credit in a laboratory science in historical geology.)*

4. *Historical Geology Laboratory.* I, II. 1 hr. PR or Conc.: Geol. 3.

7. *Physical Oceanography.* II. 3 hr. The geography and geology of ocean basins and margins, the chemical and physical properties of sea water, and the examination of the source and location of resources in the sea.

Upper Division

127. *Map Interpretation.* I. 2 hr. PR: Geol. 1 or 5. Relation of earth structure and history to land forms as shown on topographic maps.

151. *Structural Geology.* I. 4 hr. PR: Geol. 1 or 5, and 2 or Minerals 2 and Phys. 1 or 11 or consent. Introduction to stress, strain, and rheological behavior of geologic materials. Systematic study of types of structures, their field relationships and their development.

152. *Topics in Structural Geology.* I. 4 hr. PR: Geol. 1 or 5, Geol. 2, Geol. 184, Phys. 1 or 11, or consent. *(One-day field trip required at student's expense.)* Systematic study of types of structures involving their field occurrence. Introduction to the mechanistic aspects of the formation of structures. Comparative studies of structures.

184. *Mineralogy.* I. 4 hr. PR: Geol. 1, Chem. 15, or conc. Elements of crystallography and systematic study of minerals except silicates. Identification of minerals by their physical properties supplemented by blow-pipe analysis.

185. *Mineralogy and Petrography.* II. 4 hr. PR: Geol. 184. Description, mode of occurrence, and classification of silicate minerals and rocks.

201. *Physical Geology for Teachers*. I, II. 3 hr. *(Credit cannot be obtained for both Geol. 201 and Geol. 1 or 5.)* PR: High school teaching certificate and consent. Composition and structure of earth and the geologic processes which shape its surface.

221. *Geomorphology*. II. 3 hr. PR: Geol. 1 or 5. *(Optional field trip at student's expense.)* An examination of the physical processes which shape the surface of the earth, with emphasis on fluvial processes and environmental geomorphology.

222. *Glacial Geology*. I. 3 hr. PR: Geol. 1 or 5. *(Optional field trip(s) at student's expense.)* Introduction to glaciology and glacial geology, with emphasis on topographic form and the nature of glacial deposits. The Quaternary history of North America is stressed.

228. *Photogeology*. II. 3 hr. PR: Geol. 127, 152, or consent. Instruction in basic and advanced techniques of air-photo interpretation.

231. *Invertebrate Paleontology*. I. 4 hr. PR: Geol. 3, 4, or consent. Invertebrate fossils: biologic classification, evolutionary development, ecology, and use in correlation of strata.

235. *Introductory Paleobotany*. I. 4 hr. PR: Geol. 3. *(Required Saturday field trips at student's expense.)* Resume of development of principal plant groups through the ages, present distribution, mode of occurrence and index species, methods of collection.

251. *Advanced Topics in Structural Geology*. II. 4 hr. PR: Geol. 152 or consent, and Geol. 261 or consent; Math. 15; undergraduates need consent. *(Basic field equipment and field trip at student's expense.)* Studies into the development of structures emphasizing both theoretical and experimental approaches. Two two-day field trips required. *(Offered in Spring of odd years.)*

261. *Stratigraphy and Sedimentation*. II. 3 hr. PR: Geol. 3, 4, 152, 185, or consent. *(Two-day field trip required. Basic field equipment and field trips at student's expense.)* Study of sediments and sedimentary rocks. Field techniques stressed as data gathered and interpreted from rocks of Pennsylvanian age in the Morgantown vicinity.

266. *Appalachian Geology Field Camp*. S. 6 hr. PR: Geol. 152, 185, 261, and consent. *(Living expense in addition to tuition must be paid at time of registration.)* Practical experience in detailed geological field procedures and mapping.

270. *Mineral Resources*. II. 3 hr. PR: Geol. 1, 184. Description, mode of occurrence, and principles governing the formation of ore deposits.

272. *Petroleum Geology*. II. 3 hr. PR: Geol. 152. Origin, geologic distribution, methods of exploitation, uses and future reserves of petroleum and natural gas in the world.

273. *Petroleum Geology Laboratory*. II. 1 hr. PR or Conc.: Geol. 152. Well sample description, correlation, and interpretation. Construction and interpretation of subsurface maps used in exploration for hydrocarbons.

274. *Coal Geology*. I. 3 hr. PR: Geol. 152 or consent. Introduction to the origin, composition, geologic distribution, and exploration of coals.

290. *Geologic Problems*. I, II, S. 1-6 hr. (12 hr. max.) PR: Consent. *(Also includes field trips such as Florida Bay carbonate trip.)* Special problems for senior and graduate students.

294. *Introduction to Geochemistry*. II. 4 hr. PR: Chem. 16. Basic review of physical and aqueous chemistry, discussion of basic geochemical processes; calcium carbonate chemistry, diagenetic processes, weathering, the silicate and iron system.

315. *Environmental Geoscience*. I. 3 hr. PR: Geol. 1 or consent for nongeology majors. *(Field trips and independent field project required.)* Principles, practice, and case histories in application of earth science to environmental problems. Includes: water quality; landslides, subsidence; waste disposal; legal aspects; and geologic aspects of land-use planning.

329. *Problems in Geomorphology*. I, II. 1-4 hr.

340. *Advanced Stratigraphy*. I. 3 hr. PR: Geol. 261. *(Field/laboratory project required.)* Study of the principles of carbonate stratigraphy, including rock and time correlations, carbonate facies through geologic history, and carbonate hydrocarbon reservoirs. *(Offered in Fall of odd years.)*

341. *Carbonate Sedimentology*. II. 4 hr. PR: Geol. 231, 261. Origin and distribution of modern marine carbonate sediments as models for interpretation of ancient limestone and dolomite facies complexes. Laboratory experience in thin section petrography of skeletal and nonskeletal carbonate grains, and rock compositions and fabrics.

346. *Advanced Sedimentation*. I. 4 hr. PR: Geol. 261 or consent. *(Required field trips at student's expense.)* Origin of sedimentary rocks; principles involved in interpretation of ancient geography, climates, animals, and plants. Emphasis on detrital sediments and rocks.

351. *Tectonics*. II. 3 hr. PR: Geol. 152 and 261 or consent; Math. 15; undergraduates need consent. Theories of large-scale deformational processes operating within the earth's crust and mantle emphasizing regional structural geology outside the Appalachians. *(Offered in Spring of even years.)*

353. *Geophysics*. II. 4 hr. PR: Math. 15, Geol. 152, 261 or equiv. Geologic interpretation of geophysical data with emphasis placed on structural and stratigraphic interpretation of seismic records in explorations for hydrocarbon deposits.

357. *Basin Structures*. I. 4 hr. PR: Geol. 152, 261, or equiv. The origin, development, and distribution of basins and the structure found within basins throughout the world are studied. The distribution of energy-related materials related to basins and structural accumulations are emphasized.

363. *Groundwater Hydrology*. I. 3 hr. PR: Geol. 1 or consent. Study of the principles of groundwater hydrology; occurrence, development, uses, and conservation of groundwater.

364. *Advanced Groundwater Hydrology*. II. 3 hr. PR: Geol. 1, 2, 363 or consent. Review of groundwater exploration, flow, and quality in various geologic terrains. Groundwater pollution and other environmental effects are covered, along with well pumping tests and modeling of groundwater flow.

376. *Coal Petrology*. II. 3 hr. PR: Geol. 274 or consent. Microscopic examination and determination of optical properties of coals, environment of deposition, diagenesis, and metamorphism of coals; coal chemistry and petrography.

385. *Optical Mineralogy and Sedimentary Petrology*. I. 4 hr. PR: Geol. 185 and one year of physics. Principles and practice in use of the petrographic microscope in identification of minerals by the immersion method and in thin section; emphasis on sedimentary petrology.

394. *Physical Geochemistry*. I. 3 hr. PR: Geol. 1, 184, 185; Chem. 16. Phase diagrams, metamorphic facies, origin of the elements, chemical properties of ions, crystal chemistry of minerals, element distributions, and geochemical cycles. *(Offered in Fall of even years.)*

395. *Aqueous Geochemistry.* II. 3 hr. PR: Geol. 1, Chem. 16, or consent. Review of basic chemical principles as they apply to aqueous geologic environments. Properties of water and the types, sources, and controls of the common and environmentally significant chemical species dissolved in water.

399. *Quantitative Methods in Geo-Sciences.* II. 3 hr. PR: Stat. 212 or 311 or consent. Brief review and introduction to multivariate quantitative techniques as applied to geology and geography.

Major in Geography—B.A.

The undergraduate major in geography stresses our relationship to physical and human environments, and the search for explanation of the patterns and processes of human activity over the earth's surface. The general course requirements provide training for positions such as cartographers, foreign service officers, planners, and researchers and as market analysts and location planners in various levels of government, business, and industry. Students also are given preparation for elementary and secondary teaching and for graduate studies in such fields as environmental studies, urban affairs, planning, and geography.

The program is structured around a core of geography courses and offers five options designed to provide training for either employment or advanced studies in each emphasis area. The options include Planning, International Area Studies, Physical Environment and Resources, Cartography, and a Generalist option for students who desire to arrange a program with less emphasis on a particular theme. Each option lists a group of required and recommended courses from geography and other departments relevant to the particular emphasis area.

Courses Required for All Options

Geog. 7, 8 or 1, 105, 109, 140, 261.

Generalist Option

Required Courses: 15 additional hours of geography.

Planning Option

The planning option introduces the student to processes of physical and social planning which shape the spatial order of contemporary society. Emphasis is placed on both urban and rural environments to include problems related to each setting. The option provides a background for careers or advanced study in urban or regional planning, locational analysis, community planning, and environmental design. A planning internship is included in the program and most of the courses have a practical orientation.

Required Courses: Geog. 110, 209, 225, 230, 285, 295.

Recommended Electives: Ag. Ec. 200, 211; C.S. 1, 2; Econ. 255, 257; Engl. 208; Geog. 150, 215, 219, 235; Geol. 221; Pol. S. 121, 225; Soc. & A. 131, 222, 231, 241; Stat. 101.

International Area Studies Option

This option allows the student to specialize in one or more regions of the world and gain a basic background in international economic, political, and cultural relationships. The program not only deals with specific regional problems, but also the global issues of colonialism, nationalism, development, international cooperation and trade, multi-national corporations and the competition and relationships between capitalist, socialist, and non-aligned

nations. The international studies option gives the student an analytical background in international affairs, preparation for graduate work in various fields, and a background for employment in government, business, banking, communications, and international organizations.

Required Courses: Geog. 202, 215; Econ. 110; Pol. S. 160; 6 hours from Geog. 141, 143, 144, 145.

Recommended Electives: Econ. 213, 250; Engl. 208; Geog. 285; Hist. 264; Pol. S. 261, 263.

Other courses relevant to international studies will be arranged according to the student's regional or topical specialization.

Physical Environment and Resources Option

This option emphasizes the interaction between physical environmental systems and human activity. It also provides a training for students interested in problems related to the exploitation of physical resources. Students gain mapping and other skills essential for analyzing environmental problems resulting from the exploitation and management of energy, mineral, land, and water resources, as well as a substantive inquiry into particular environmental and resource utilization issues. This option provides a background for employment or advanced study in environmental impact analysis, remote sensing, and environmental planning.

Required Courses: Geog. 107, 219, 220, 285; Geol. 1, 2, 3, 4, 127, 221; Math. 4.

Recommended Electives: Geog. 295; Biol. 254; C.E. 5; Engl. 208; For. 140, 226; M.E.R. 97; Phys. 117; Pol. S. 236; Stat. 101; Geol. 315, 363; Chem. 11, 12.

Other electives may be arranged as relevant to the student's particular interests.

Cartography Option

This option provides specialization in the art and science of making maps. A background in geography allows the cartographer to recognize and analyze various spatial distributions which he or she must interpret and communicate to the map reader. The required courses provide a knowledge of geographical patterns, data manipulation and compilation, positive and negative artwork techniques, as well as surveying, aerial photography, and remote sensing. The student may specialize further with selected courses in order to concentrate on statistical and computer-assisted cartography or map design and construction. Internships in practical cartography are available in local planning agencies and in university research units working with mini-computer mapping systems. The cartography option prepares the student for graduate study or a career in federal, state or local government agencies or commercial mapping firms.

Required Courses: Geog. 220, 262, 285, and 6 additional hours in Geography; C.E. 5; For. 226; Geol. 127; and 6 hours in Mathematics.

Recommended Electives: Art 121; Astro. 106; C.E. 6; C.S. 1, 2; Engl. 208; Geog. 220, 225, 235, 295; Geol. 1, 2; Journ. 1, 110, 120; Phys. 8, 116; Psych. 1; Stat. 101, 212, 221.

Honors Program

Qualified students in geography are encouraged to participate in the department's Honor Program which begins either the second semester of the junior year or the first semester of the senior year and culminates in a senior thesis. Entry requires a 3.3 overall average. (See the department's Honors Coordinator.)

Courses of Instruction in Geography (Geog.)

Lower Division

1. *Introduction to Geography.* I, II. 3 hr. Basic principles of the discipline, including maps, climate, physiography, urban, economic, political, and cultural geography. *(Not open to students who have completed either Geog. 7 or 8.)*

7. *Physical Geography.* I, II. 3 hr. An introduction to the various global environmental systems operating on the earth's surface and examination of human interaction with these natural processes.

8. *Human Geography.* I, II. 3 hr. Introduction to the geographical dimension in human behavior and the human-altered landscape including social, demographic, economic, and political attributes of societies.

Upper Division

105. *Resource Utilization and the Environment.* I, S. 3 hr. An analysis of the problems associated with natural resource utilization in the United States. The functional concept of resources is defined and evaluated in terms of land-use planning, pollution abatement, and alternate resource utilization strategies.

107. *Weather and Climate.* I, II. 3 hr. Processes of weather and patterns of climate and their significance to people.

109. *Economic Geography.* II. 3 hr. Earth's land use patterns and interactions that result from our economic activities. Includes the analysis of industrial location, mineral exploitation, and agricultural patterns.

110. *Urban Geography.* I. 3 hr. Introduction to the geography of the city incorporating consideration of urban systems and city-region linkages, patterns and processes of urban land use, the social geography of the city, and contemporary urban problems.

140. *United States and Canada.* I. 3 hr. Regional study of the United States and Canada emphasizing such geographic features as climate, natural vegetation, topography, natural resources, population distribution and trends, agriculture, manufacturing, transportation systems, and regional culture.

141. *Geography of Western Europe.* I or II. 3 hr. Regional characteristics, problems of development, and human ecology of the area.

143. *Geography of Africa.* I or II. 3 hr. Systematic and regional characteristics and geographic problems of political, social, and economic development.

144. *Latin America.* I or II. 3 hr. Regional study of Central America, the West Indies, and South America emphasizing such physical and human geographical factors as natural resources, climate, population characteristics and trends, culture, economic development, and political patterns.

145. *Monsoon Asia.* II. 3 hr. Study of the physical and cultural geographic patterns of southern and eastern Asia with emphasis on China, Japan, and India.

150. *Transportation Geography.* I. 3 hr. A practical and theoretical approach to transportation systems including an examination of networks, modes, and flows at different geographical scales. Emphasis is placed on transportation as a spatial factor in urban and regional development. *(Offered in Fall of even years.)*

200. *Spatial Analysis.* II. 3 hr. Introduces quantitative techniques for the collection, classification, and spatial analysis of geographical data. Emphasizes map analysis and the application of spatial analysis to geographical problems occurring in everyday contexts.

201. *Geography of West Virginia.* II. 3 hr. Study of past, present, and future patterns of the physical environment of West Virginia as modified by human activities. To learn the use of geographical information systems for planning in West Virginia.

202. *Political Geography*. II. 3 hr. Examines the interrelationship between politics and the environment, human territoriality, the political organization of space, geopolitical aspects of the nation-state and international problems.

205. *Environmentalism in the United States*. II. 3 hr. Surveys natural resource exploitation and environmental alteration in the United States from the beginning of European settlement, with consideration of changing natural resource, conservation, and environmental perceptions and policies.

209. *Industrial Location*. II. 3 hr. PR: Geog. 109 or consent. Applied theoretical aspects of location decisions in primary, secondary, and tertiary activities. Emphasis will be on the understanding of location patterns and the impact of industries on other characteristics of communities.

215. *Population Geography*. I. 3 hr. Study of the geographic distribution of population and population characteristics including density, age, fertility, mortality, and settlement patterns. Problems of migration and population/resource issues also will be covered, with an emphasis on developing countries. *(Offered in Fall of odd years.)*

219. *Problems in Geography*. I, II. 1-9 hr. PR: Consent. Independent study or special topics.

220. *Seminar in Geography*. I, II. 1-9 hr. per sem.; max. 15 hr. PR: Consent. Includes separate seminars in urban, economic, physical, behavioral, social, Appalachian, transportation, census, planning, resource, international studies, geographic model building, rural problems, cartography, aging and environment, and energy.

225. *Urban Planning Concepts and Techniques*. II. 3 hr. PR: Geog. 110 or Pol. S. 121 or consent. Explores concepts, techniques, and processes of physical and socio-economic planning and their application to urban problems including: land-use allocation and control, location of economic activity, housing, transportation, and the delivery of social services.

230. *Rural Settlement*. I. 3 hr. Analysis of the form and process of settlement in rural and urban fringe areas. Topics include housing, employment, mobility patterns, service opportunities, and cultural characteristics of rural populations with emphasis on current patterns of change.

235. *The Experience of Space*. II. 3 hr. Explores the individual's changing experience of geographical space over the life cycle as reflected in activity patterns, territoriality, and environmental images. Traces environmental design implications for settings including schools, nursing homes, parks, and shopping malls.

261. *Cartography*. I. 3 hr. An introduction to mapping, including historical developments, coordinate systems, projections, generalization, symbolization, map design, computer-assisted cartography, landform representation, and data manipulation for dot, graduated symbol, chloropleth, and isarithmic maps.

262. *Cartographic Techniques*. II. 3 hr. PR: Geog. 261 or consent. Advanced map construction including positive and negative artwork, darkroom techniques, color and color proofing, and map reproduction.

265. *Aging and Environment*. II. 3 hr. PR: MDS 50 or consent. Explores the older persons's changing experience of the environment. Physiological, psychological, and social changes are related to adjustment within urban and rural community environments, special housing for the elderly, and long-term care environments.

285. *Methods of Geographic Research*. I. (Alternate Years.) 3 hr. PR: Consent. Geographic analysis as problem-solving activity. Practical experience in field techniques, library research, hypothesis formation and testing, and report preparation and presentation. Students will acquire skills in literary and numerical approaches to geographic data analysis.

290. *Geographical Perspectives on Energy.* II. 3 hr. PR: Consent. A survey of the distribution of finite, renewable, and continuous energy resources and an investigation of the geographical patterns of energy consumption and energy flows. The policy implications of an unequal distribution of energy are evaluated.

295. *Internship.* I, II, S. 1-12 hr. PR: Junior standing and consent. A working internship with an agency or company designed to give the student experience in the practical application of geographic training to specific problems.

299. *Honors Thesis.* I, II, S. 3-6 hr. PR: Departmental consent. Thesis proposal, writing, and defense for students admitted to the Honors Program.

History

Faculty

Jack L. Hammersmith, Ph.D. (U. Va.), *Chairperson and Associate Professor.*
William S. Arnett, Ph.D. (Ohio St. U.), *Associate Professor.*
Wesley M. Bagby, Ph.D. (Columbia U.), *Professor.*
William D. Barns, Ph.D. (WVU), *Professor.*
John A. Caruso, Ph.D. (WVU), *Professor Emeritus.*
Elizabeth Cometti, Ph.D. (U. Va.), *Professor Emerita.*
Charles W. Connell, Ph.D. (Rutgers U.), *Associate Professor; Associate Dean, College of Arts and Sciences.*
William T. Doherty, Jr., Ph.D. (U. Mo.), *Professor; University Historian.*
Barbara J. Howe, Ph.D. (Temple U.), *Visiting Assistant Professor.*
Elizabeth K. Hudson, Ph.D. (Ind. U.), *Associate Chairperson and Associate Professor.*
Carl M. Hunt, Ph.D. (WVU), *Lecturer (part-time).*
Mortimer Levine, Ph.D. (U. Penn), *Professor.*
Stephen C. McCluskey, Ph.D. (U. Wisc.), *Assistant Professor.*
William R. McLeod, Ph.D. (U. Md.), *Associate Professor.*
Robert M. Maxon, Ph.D. (Syracuse U.), *Professor.*
John A. Maxwell, Ph.D. (WVU), *Associate Professor.*
Dennis H. O'Brien, Ph.D. (U. Ill.), *Associate Professor.*
George P. Parkinson, Jr., Ph.D. (U. Wisc.), *Associate Professor; Curator, West Virginia Collection.*
Sarah R. Smith, Ph.D. (Columbia U.), *Associate Professor Emerita.*
Edward M. Steel, Jr., Ph.D. (U. N.C.), *Professor.*
John C. Super, Ph.D. (UCLA), *Associate Professor.*
John A. Williams, Jr., Ph.D. (Yale U.), *Professor.*

Major in History

Required Courses

History majors must meet University and College requirements for the Bachelor of Arts degree. The Department of History requires the following:

1. History majors must complete a total of 33 hours (including History 290) of work in history, of which at least 21 hours are to be selected from upper-division courses. Majors should divide these 33 hours between American and non-American courses with at least one course from the fields of African, Asian *or* Latin American history. (See Group I and II below.)

2. History majors are required to complete a minor of at least 9-12 upper-division hours in a related subject, exclusive of hours used to satisfy other departmental requirements.

3. History majors are required to achieve a 2.0 (C) average for all courses attempted in the major subject.

History Courses

Group I (American): Hist. 4, 52, 53, 141, 142, 153, 155, 156, 157, 159, 161, 175, 209, 212, 251, 252, 253, 257, 259, 261, 263, 264, 266, 267, 268, 269, 273, 274.

Group II (Non-American): Hist. 1, 2, 5, 6, 11, 12, 101, 103, 105, 107, 109, 117, 118, 119, 120, 121, 122, 200, 201, 202, 204, 205, 206, 207, 208, 210, 213, 214, 215, 216, 217, 218, 222, 225, 226, 227, 228, 229, 230, 231, 232, 241, 242.

With the approval of the student's adviser and the chairperson of the department, the student may elect options at the 300-course level. (See the *Graduate Catalog.)*

Program in the History of Science and Technology

Students interested in pursuing courses in this area should consult Professor Emory Kemp at the History of Science and Technology office in G14 Woodburn Hall.

Faculty includes Emory L. Kemp, Ph.D. (U. Ill.), *Professor, Multidisciplinary Studies,* and Peter Gottlieb, Ph.D. (U. Pitt), *Assistant Professor, Multidisciplinary Studies.*

Courses of Instruction in History (Hist.)

Lower Division

1. *Western Civilization: Antiquity to 1600.* 3 hr. *(Hist. 1 does not have to precede Hist. 2.)* A survey of the major developments in Western civilization beginning with the ancient Mediterranean world and concluding with Reformation Europe.

2. *Western Civilization: 1600 to Present.* 3 hr. *(Hist. 2 may precede Hist. 1.)* A survey of major developments in Western civilization from 1600 to the present with attention to Europe's emerging industrial society and changing role in world affairs.

4. *Latin America: Past and Present.* 3 hr. Introduction to Latin American history, stressing the relationship between the past and present. Special emphasis is given to economic problems, political development, and social change in modern Latin America.

5. *Africa and the Middle East.* 3 hr. Introduction to the history of Africa and the Middle East. Special attention is given to political developments, economic problems, relations with the West, and cultural patterns and changes in the modern era.

6. *East Asia: An Introduction.* 3 hr. Focuses on modern China, Japan, and Korea. Consideration of important problems facing each nation today together with the cultural and historical developments which help explain contemporary affairs in East Asia.

11. *Science, Magic, and Religion.* 3 hr. Examination of the historical development of scientific ideas from the beginning of Western culture through establishment of Newtonian natural philosophy.

12. *Modern Science: Forces, Energy, Order.* 3 hr. Examination of the historical development and interaction of major themes of scientific thought from the beginning of the eighteenth century through the industrial revolution to the present.

52. *Growth of the American Nation to 1865.* 3 hr. *(Hist. 52 does not have to precede Hist. 53.)* Examines the basic political, economic, and social forces in formation and development of United States before 1865. Emphasis on national development from independence through Civil War.

53. *Making of Modern America, 1865 to the Present.* 3 hr. *(Hist. 53 may precede Hist. 52.)* Continues the examination of basic political, economic, and social forces in the development of the United States since the Civil War.

Upper Division

101. *History of Ancient Times: Stone Age to the Fall of Rome.* 3 hr. Ancient civilizations of the Near East and the Mediterranean.

103. *Medieval Europe: Fall of Rome to the Renaissance.* 3 hr. Historical development of civilization in Europe from 300 to c. 1300 A.D. Semi-topical approach with attention to problems of church development, cultural conflict, church-state relations, social-economic expansion, and intellectual evolution.

105. *Early Modern Europe: Renaissance to the Enlightenment.* 3 hr. Concentrates on political and social developments between 1300-1715 with attention to the Reformation crisis, the seventeenth-century struggle for effective government in England and France, the realignment of European powers, and the rise of modern science.

107. *Revolutionary Europe.* 3 hr. Traces the development of European history from the reign of Louis XV to the end of the Franco-Prussian War. Political and social history emphasized.

109. *Twentieth Century Europe.* 3 hr. Traces the major political, economic, and social developments of Europe from World War I to the present.

111. *Special Topics in History.* 1-3 hr. *(May be repeated for a maximum of 9 credit hours as long as content for each semester of Hist. 111 is different.)* Selected topics in history.

117. *History of Russia: From Kiev to Nicholas I.* 3 hr. Interdisciplinary approach integrating political, social, economic, diplomatic, and cultural studies to provide more than an introduction to the history of Russia. In-depth study of the various aspects of Russian life in an attempt to provide an understanding of the forces which produced the Russian autocracy.

118. *History of Russia: From the Emancipation to the Present.* 3 hr. Using the same approach as in Hist. 117, an attempt is made to follow the changes which turned an underdeveloped country into one of the major world powers.

119. *British Civilization to 1660.* 3 hr. History of Britain, mainly England, from the earliest times to the Restoration. Political, constitutional, diplomatic, economic, social, religious, intellectual, and cultural developments considered.

120. *British Civilization Since 1660.* 3 hr. History of Britain, mainly England, from the Restoration to the present.

121. *History of Modern Germany.* 3 hr. German history from Congress of Vienna to the end of World War II. Student gains special knowledge of more specialized topics by selecting literature and writing essays on these topics.

122. *Hitler and the Third Reich.* 3 hr. A study of the myths and realities of Hitler's private and public life. Emphasis on his rise to power, particularly his party, ideology, and propaganda techniques, and his position and policies as Fuehrer.

141. *Latin America: Culture, Conquest, Colonization.* 3 hr. History of the formative period of Latin America, emphasizing the social and economic interaction between Indians, Europeans, and blacks from the conquest to the wars for independence in the early nineteenth century.

142. *Latin America: Reform and Revolution.* 3 hr. History of modern Latin America, concentrating on the durability of nineteenth-century social, economic, and political institutions, and the twentieth-century reformist and revolutionary attempts to change those institutions.

153. *West Virginia.* 3 hr. Historical foundations and development of West Virginia, with particular emphasis upon the growth of the government, the economy, and the traditions of the state.

155. *History of American Colonial Society, 1607-1763.* 3 hr. The planting and maturation of the English colonies of North America. Relationships between Europeans and Indians, constitutional development, religious ferment, and the colonial economy are studied.

156. *History of the American Revolution, 1763-1790.* 3 hr. The immediate origins and long-range consequences of the movement for independence from Great Britain; includes the 1775-1790 controversy over the charter of new state and federal governments.

157. *The Early Republic, The United States, 1781-1861.* 3 hr. *(Completion of Hist. 52 is advised.)* American history from the Revolution to the Civil War is followed in detail, with particular attention to the formation and operations of government under the Confederation and the Constitution, the development of political parties, the beginnings of industrialization, and the sectional struggles that culminated in war.

159. *The United States, 1865-1918.* 3 hr. Development of the United States during the most intensive phase of American industrialization; special emphasis on ideas of selected Americans on how to cope with the increase in poverty and social malaise which accompanied economic development; attention is also given to the roots of American imperialism.

161. *Recent America, The United States Since 1918.* 3 hr. *(Primarily for non-History majors.)* The 1920's, the New Deal, World War II, and a survey of developments since World War II.

175. *The Coal Industry in America.* 3 hr. The historical development of the coal industry: the technology of extraction, the political and economic context, the United Mine Workers of America, and the particular social problems of the industry will be emphasized.

200. *Greece and Rome.* 3 hr. Covers the Minoan and Mycenaean civilizations, Archaic and Classical Greece. Alexander the Great and the Hellenistic Age, the Roman Republic, the Etruscan and Carthaginian states, and the rise of the Roman Empire.

201. *Social and Economic History of the Middle Ages, 300-1000.* 3 hr. *(Hist. 103 is recommended as preparation.)* The social-economic crisis of the late Roman and German institutions, the Merovingian and Carolingian economies, Pierenne Thesis, and transition to feudal society.

202. *Social and Economic History of the Middle Ages, 1000-1500.* 3 hr. (Hist. 103, 201 are recommended as preparation.) Feudal society, land and population expansion, fairs, towns, leagues, Italian leadership, crusades, church influence, black death, fourteenth-century revolts, and general decline of late Middle Ages.

204. *Ancient and Medieval Science.* 3 hr. Examination of scientific achievements from ancient myths to medieval philosophies of nature. Stresses the internal coherence of the approaches to nature taken by various cultures. No scientific background is assumed.

205. *The Renaissance.* 3 hr. The underlying political, economic, and social structure of fourteenth and fifteenth century Italy with concentration on the significant intellectual and cultural trends which characterized the age. Some consideration given to the problem of the impact of the early Reformation movement upon Renaissance culture.

206. *The Reformation.* 3 hr. Distinguishing theological characteristics of the major Reformation movements with concentration on the effect of religious-intellectual crisis on the political and social structure of the sixteenth century.

207. *Early European Science and Culture.* 3 hr. Examination of European intellectual history from the Renaissance to the early eighteenth century with particular attention being paid to the contributions of Copernicus, Bacon, Descartes, Kepler, Galileo, and Newton.

208. *Science and Society, 1750-1914.* 3 hr. Historical examination of the relationship between science and technology with particular attention being paid to the doctrines of Positivism, Darwinism, and Scientific Socialism.

209. *Brazil: Colony to World Power.* 3 hr. Examines the transition of Brazil from a colony to a world power, with special emphasis on recent economic developments, regional diversity, political patterns, foreign affairs, and race relations.

210. *Modern Spain.* 3 hr. Survey of the Moslem, Hapsburg, and Bourbon periods followed by an examination of modern political and social forces, the Civil War, and the rule of Franco.

211. *Technology in the Industrial Revolution.* 3 hr. Technological and social change in Great Britain and the United States. Case studies illustrating the nature of technological development and providing an understanding of the ways in which technology has shaped human experience.

212. *Introduction to Public History.* 3 hr. Introduction to a wide range of career possibilities for historians in areas such as archives, historical societies, editing projects, museums, business, libraries, and historic preservation. Lectures, guest speakers, field trips, individual projects.

213. *Bourbon France.* 3 hr. French history from the reign of Henry IV to the reign of Louis XVI. Special attention given to the reigns of Louis XIII and Louis XIV. Political, cultural, and intellectural history.

214. *The Revolutionary-Napoleonic Era.* 3 hr. French history from mid-eighteenth century to 1815. Special attention given to the background of the French Revolution of 1789, to the political and social history of the revolution, and to Napoleon's nonmilitary achievements.

215. *European Diplomatic History, 1815 to 1919.* 3 hr. Develops an understanding of the forces, men, and events which determined diplomatic relations between the major powers.

216. *European Diplomatic History, 1919 to Present.* 3 hr. Scope similar to Hist. 215.

217. *Diplomatic History of the U.S.S.R., 1917 to 1939.* 3 hr. Detailed study of Soviet diplomatic history, with emphasis on the view from the Kremlin balanced by the responses of other powers. Understanding of European diplomatic history desirable.

218. *Diplomatic History of the U.S.S.R., 1939 to Present.* 3 hr. Scope similar to Hist. 217.

222. *Twentieth-Century Germany from Weimar to Bonn.* 3 hr. The Weimar Republic, the Third Reich, and the two German states created after World War II.

225. *History of Modern China.* 3 hr. Introduction to modern China (since 1839) with some attention to China's Confucian heritage; the Chinese effort to modernize in the face of Western diplomatic and economic pressure; specific attention to China's Nationalist and Communist revolutionary traditions.

226. *History of Modern Japan.* 3 hr. Modern Japan (since 1868) with some attention to development of Japanese institutions and ideas in earlier periods, especially the Tokugawa Era (1600-1868); examines the rapid pace of economic change in the nineteenth and twentieth centuries along with the important social, political, and diplomatic implications of this change.

227. *East Africa to 1895.* 3 hr. East Africa from earliest times to the beginning of European control. Population movement and interaction, development of varying types of polity, revolutionary changes, and the European scramble for East Africa form the major focus. *(Course will not be offered in 1983-84.)*

228. *East Africa Since 1895.* 3 hr. History of colonial rule and movement to independence in East Africa. Political, economic, and social changes will be examined with particular emphasis on the rise and triumph of African nationalism. *(Course will not be offered in 1983-84.)*

229. *History of Africa: Pre-Colonial.* 3 hr. History of Africa from earliest times to the middle of the nineteenth century. Particular emphasis on population and interaction, state formation, and the development of trade in sub-Saharan Africa as well as the impact of such external influences as Christianity and Islam.

230. *History of Africa: European Dominance to Independence.* 3 hr. History of Africa from the middle of the nineteenth century to the 1960s. In the first half of the course, the establishment and functioning of European colonial regimes in African history, and recent interpretations in the field.

231. *Seventeenth Century Britain, 1603-1715.* 3 hr. The more significant political, social, economic, religious, and intellectual developments of Britain during a century of revolution and of the men and women who interacted with those movements.

232. *Eighteenth Century Britain, 1715-1832.* 3 hr. The "Age of Aristocracy," the political, social, religious, economic, and intellectual forces which produced it, and the reasons for its decline under the combined impact of the Industrial, Agricultural, American, and French revolutions.

241. *English Social History, Fourteenth to Eighteenth Century.* 3 hr. Topical examination of English society from the time of Chaucer to Milton. Major topics: society in town and country, economy, politics, religion, and thought.

242. *English Social History, Eighteenth Century to the Present.* 3 hr. Topical examination of English society from the time of Queen Anne to the present.

251. *History of Black People in America to 1900.* 3 hr. Slave trade and evolution of slavery in the New World, the attack upon slavery and its destruction, the South and the blacks during Reconstruction, and age of Reaction and Racism, 1875-1900.

252. *History of Black People in America Since 1900.* 3 hr. Race conflict and black migration, the blacks in American world wars, desegregation practices in the South and the North, and trends toward black nationalism.

253. *Civil War and Reconstruction.* 3 hr. Causes as well as constitutional and diplomatic aspects of the Civil War; the role of the American black in slavery, in war, and in freedom; and the economic and political aspects of Congressional Reconstruction.

257. *The United States From McKinley to the New Deal, 1896 to 1933.* 3 hr. American national history from William McKinley to Franklin D. Roosevelt. Particular attention is given to great changes in American life after 1896; national political, economic, social, and cultural development; the Progressive Era in American politics; and alterations in American foreign relations resulting from the Spanish-American War and World War I.

259. *Recent American History, 1933 to Present.* 3 hr. American national history from the inauguration of Franklin D. Roosevelt to the present. Emphasis on the New Deal; Roosevelt's foreign policies and their impact on American social, technological, and cultural developments; and United States domestic problems and foreign relations since 1945.

261. *Economic and Social Development of West Virginia.* 3 hr. Regional study of the economic, social, technological, cultural, and religious history of West Virginia.

263. *American Diplomacy to 1918.* 3 hr. *(Assumes some knowledge of the period such as that obtained in Hist. 52 and 53.)* American foreign policy and diplomacy from the adoption of the Constitution to the end of World War I.

264. *American Foreign Policy and Diplomacy, 1918 to the Present.* 3 hr. *(Assumes some knowledge of the period such as that obtained in Hist. 2, 53, or 161.)* America's foreign policy and growing involvement in international relations including the U.S. role in World War II, the Korean War, and Vietnam.

266. *American Economic History to 1865.* 3 hr. Origins and development of American business, agricultural, and labor institutions problems, and policies, from 1600 to 1865; influence of economic factors upon American history during this period. *(Course will not be offered in 1983-84.)*

267. *American Economic History Since 1865.* 3 hr. Scope similar to that stated for Hist. 266. *(Course will not be offered in 1983-84.)*

268. *The Old South.* 3 hr. *(For advanced undergraduate and graduate students.)* History of the South—exploring peculiar differences that led to an attempt to establish a separate nation. The geographical limitation permits a detailed study of economic and social forces within the context of the larger national history.

269. *The New South.* 3 hr. Integration of the South into the nation after the Civil War. Emphasis on southern attitudes toward industrialization, commercial agriculture, organized labor, and the black. Special attention to the southern literary renaissance and conservative and progressive politics of the southern people.

273. *The City in American History 1.* 3 hr. The Era of Commerce, 1630-1895, concerning the settlement, design, and growth of North American commercial and administrative centers, particularly transportation development and the role of urban elites in shaping national economic policies.

274. *The City in American History 2.* 3 hr. The Industrial Age, 1820-present, focusing on the interaction of industrialization and urbanization during the nineteenth and twentieth centuries, particularly the impact of technology upon urban life and the role of cities in national politics.

290. *Introduction to Historical Research.* 3 hr. PR: History major or consent. Introduction to research techniques useful for history. Instruction in locating sources, taking notes, and writing research papers.

History of Art

See Interdepartmental Majors, page 89.

Humanities

Jack Welch, D.A. (Carnegie-Mellon U.), *Coordinator of Humanities and Associate Professor of English.*

The study of humanities means pursuing the accumulated knowledge and experience contained in world literature, history, fine arts, religion, and philosophy in an active consciousness of the living, operating, and continuing values in human culture.

Courses of Instruction in Humanities (Hum.)

Lower Division

1, 2. *Introduction to the Course of Western Civilization.* I, II. 3 hr. per sem. First semester treats the high points of Greco-Roman and Medieval European civilizations: their art, architecture, philosophy, religion, literature, and culture. Second semester shows how these ideas and achievements were modified and added to during the Renaissance, the Age of Classicism, and the revolutionary nineteenth century. Sir Kenneth Clark's film series *Civilisation* will be shown during the year and other audiovisual performances will help enlighten the student.

3, 4. *Honors Seminar in Humanities.* I, II. 3 hr. per sem. Honors courses for selected students mirroring Hum. 1 and 2, respectively. Affords participants a wider opportunity for discussion than in Hum. 1 and 2 and for reading the classic statements on the nature of civilization.

5. *Cultures of China and Japan.* I, II. 3 hr. An elementary course that introduces students to the intellectual, artistic, and literary cultures and civilizations of China and Japan as they existed in their social settings.

10. *The Classic Forms of the Hero in Western Civilization.* I. 3 hr. Courage and the classic forms of the hero in the twentieth century. Historical study of art, literature, philosophy, and religious thought from the Greek classics to contemporary novels and films. (Two lectures, one discussion per week.)

11. *The Figure of the Absurd Hero in Western Civilization.* II. 3 hr. Courage and the figure of the "absurd hero" in the twentieth century. Historical study of literature, art, religion, and philosophy from the New Testament to contemporary novels and films. (Two lectures, one discussion per week.)

Upper Division

191. *Special Topics.* I or II. 3 hr.

290. *Special Topics.* I or II. 3 hr.

Individualized Major

See Interdepartmental Majors, page 88.

International Studies

See Interdepartmental Majors, page 90.

Liberal Arts

See Interdepartmental Majors, page 92.

Library Science

Faculty

Robert F. Munn, Ph.D. (U. Mich.), *Chairperson and Professor; Dean of Library Services.*
Stokely B. Gribble, M.S.L.S. (U. Ky.), *Assistant Professor; Associate Dean of Library Services.*
Clifford C. Hamrick, M.L.S. (Rutgers U.), *Assistant Professor; Chief Reference Librarian.*
Elizabeth F. Howard, Ph.D. (U. Pitt), *Assistant Professor.*
Theodore M. Judy, M.A.L.S. (WVU), *Assistant Professor; Physical Science Librarian.*
Evelyn M. Kocher, M.S.L.S. (U. N.C.), *Assistant Professor; Chief Catalog Librarian.*
Barbara Mertins, M.S.L.S. (Syracuse U.), *Assistant Professor.*
Mildred I. Moyers, M.S.L.S. (Case West. Res. U.), *Assistant Professor; Chief Bibliographer.*
Harold B. Shill, Ph.D. (U. N.C.), *Associate Professor; Head Librarian, Evansdale Library.*

Program

The Department of Library Science has two emphases: (1) Courses are offered for all students to help them to make effective use of the library and to acquaint them with major sources of information in their particular fields; and (2) Courses are available for students in elementary or secondary education who desire to qualify for certification as school library media specialists.

Courses of Instruction in Library Science (L. Sci.)

1. *Using Books and Libraries.* I, II. 1 hr. Provides a working knowledge of library facilities, particularly of the University Library. Includes how and when to use basic reference sources and search strategy for term-paper preparation. Useful to any student in the University.

190. *Teaching Practicum.* I, II. 1-3 hr. PR: Consent.

191. *Special Topics.* I, II. 1-4 hr. PR: Consent.

201.* *Reference and Bibliography.* II. 3 hr. Basic reference books, dictionaries, encyclopedias, indexes, yearbooks, and other reference materials are studied and evaluated, with emphasis on the theory and practical experience with reference books for print and nonprint materials.

203.* *Literature for Children.* I, II. 3 hr. A survey of children's literature including its historical development as well as current trends. Emphasizes selection, critical evaluation, and utilization of literary materials for developmental, recreational, and curriculum needs. Appropriate media included.

205.* *Young Adult Literature.* I, II. 3 hr. Survey of adolescent literature and other library materials (print and nonprint) adapted to the needs of junior and senior high school students. *(Course will not be offered in 1983-84.)*

222. **Field Practice.* I, II. 3 hr. PR: L. Sci. 201, 203, 205, 223, 250. Practical experience in a variety of public, school, and special libraries, and instructional materials centers, under the supervision of experienced librarians and media specialists. Students must complete 100 clock hours.

223.* *Cataloging and Classification.* I. 3 hr. Basic principles and problems of cataloging and classification combined with practical experience in processing the various types of books and materials. Problems peculiar to the teacher-librarian are considered.

250.* *Managing School Library Media Centers.* I. 3 hr. PR: L. Sci. 201, 203, 205, 223, Ed. P. 260, or consent. Covers planning, organizing, and operating a school library media center. Includes staffing, budgeting, scheduling, public relations, and program design. Stresses the role of the media center in the total educational process.

291. *Advanced Study.* I, II, S. 1-3 hr. *(Course may be repeated for credit only when the content of the course is different.)* Study of current topics related to informational resources or the school media center. A final project will be required.

326. *Bibliography of the Social Sciences.* I. 1-2 hr. Covers bibliographic structure and information sources in psychology, sociology, political science, economics, history, education, and related disciplines. Provides a good working knowledge of information retrieval tools and the ability to use libraries effectively.

*Presently required for Teacher Certification in West Virginia.

Mathematics

Faculty

James E. Miller, Ph.D. (U. Ky.), *Interim Chairperson and Associate Professor.*
Anand M. Chak, Ph.D. (Lucknow U., India), *Professor.*
Jean M. Coover, M.A. (WVU), *Assistant Professor.*
Allen B. Cunningham, Ph.D. (WVU), *Professor Emeritus.*
Hannibal A. Davis, Ph.D. (Cornell U.), *Professor Emeritus.*
James B. Derr, Ph.D. (Mich. St. U.), *Associate Professor.*
Harvey R. Diamond, Ph.D. (MIT), *Associate Professor.*
James E. Dowdy, Ph.D. (Okla. St. U.), *Associate Professor.*
Joy B. Easton, M.S., J.D. (WVU), *Assistant Professor.*
James C. Eaves, Ph.D. (U. N.C.), *Professor Emeritus.*
Harry Gingold, D.Sci. (Israel Inst. Tech.), *Associate Professor.*
Helen L. Godfrey, M.S. (WVU), *Assistant Professor.*
Jack T. Goodykoontz, Ph.D. (U. Ky.), *Associate Professor.*
Henry W. Gould, M.A. (U. Va.), *Professor.*
Judith C. Hall, M.S. (Harvard U.), *Assistant Professor.*
Harumi Hattori, Ph.D. (Rensselaer Poly. Inst.), *Assistant Professor.*
Franz X. Hiergeist, Ph.D. (U. Pitt), *Professor and Associate Chairperson.*
Caulton L. Irwin, Ph.D. (Emory U.), *Associate Professor.*
Alonzo F. Johnson, Ed.D. (Okla. St. U.), *Professor.*
Jin B. Kim, Ph.D. (VPI), *Professor.*
Vadim Komkov, Ph.D. (U. Utah), *Professor.*
James H. Lightbourne III, Ph.D. (N.C. St. U.) *Assistant Professor.*
Wilma J. Loudin, M.S. (WVU), *Assistant Professor.*
Michael E. Mays, Ph.D. (Penn St. U.), *Assistant Professor.*
Betty L. Miller, M.S. (WVU), *Associate Professor.*
James L. Moseley, Ph.D. (Purdue U.), *Assistant Professor.*
Sam B. Nadler, Ph.D. (U. Ga.), *Associate Professor.*
Iland D. Peters, M.S. (WVU), *Professor.*
John W. Randolph, Ph.D. (U. Va.), *Associate Professor.*
Samuel M. Rankin III, Ph.D. (Vanderbilt U.), *Associate Professor.*
Donald F. Reynolds, Ph.D. (TCU), *Associate Professor.*
John W. Schleusner, Ph.D. (U. Ala.), *Associate Professor.*
William H. Simons, Ph.D. (Carnegie-Mellon U.), *Professor.*
Joseph K. Stewart, Ph.D. (WVU), *Professor Emeritus.*
Victor Trutzer, Ph.D. (Carnegie-Mellon U.), *Assistant Professor.*
Marvin L. Vest, Ph.D. (U. Mich.), *Professor Emeritus.*

Mathematics Learning Center

The Department of Mathematics offers assistance to students in beginning mathematics courses through its Learning Center located in the basement of Eiesland Hall. The Learning Center has two components: the Study Hall and the Tape Center.

The Study Hall is staffed by graduate students, undergraduate assistants, and faculty, and is intended to help students enrolled in Math. 2, 3, 4, 14, 28, 33, 34, and 131.

The Tape Center is an area where students who are having difficulty with fundamental concepts or who have missed a lecture can listen to audiotapes with visual material to receive help.

The Learning Center is open Monday through Friday during the day and some evenings. The specific times are posted at the beginning of each semester.

Programs

The Department of Mathematics provides a curriculum which contains programs for an undergraduate major in mathematics, for the pre-service elementary and secondary teacher, for the student who is interested in the applications of mathematics to the fields of computer science, statistics, engineering, physical, natural and social science, and business and economics. Also included in the curriculum are courses designed to acquaint the nonscience major with the ideals and objectives of mathematics.

Freshmen and sophomores who plan to major in mathematics and who also wish to meet the requirements for certification as secondary teachers of mathematics should plan their programs carefully in order to meet both sets of requirements within the four academic years.

Students who expect to major in mathematics should maintain a grade-point average of no less than 2.5 in lower-division mathematics course work.

Enrollment in freshman-level mathematics courses is restricted to students who have demonstrated a satisfactory understanding of background material, either in the prerequisite courses specified in this *Catalog* or on the departmental placement examination. The placement test is given during Summer and Fall Orientation for freshman and transfer students, and also during the first week of each academic term. Students who intend to take the placement examination at the beginning of a term notify the Department of Mathematics on or before the day the test is administered.

Students who are registered at WVU may earn credit for a number of mathematics courses by examination. Examinations will be given at two separate times during each semester. Information concerning the regulations pertaining to credit by examination, courses listed, where and when to apply, and time and place of examinations may be obtained from the Academic Advising Center.

Major in Mathematics

The Department of Mathematics requires a minimum of 31 hours of mathematics, 3 hours of statistics, and 6 hours of computer science for the Bachelor of Arts degree. Pre-calculus courses cannot be counted toward the fulfillment of this requirement.

Required Courses

Ordinarily, the following courses will be required: Math. 15, 16, 17, 18, 141 or 215, 143 or 241, 163, 251 or 255, Stat. 261 and C.S. 220. However, in certain instances, departmental advisers may approve appropriate substitutions.

Recommended Electives

A computer science elective should be chosen so that the student will achieve programming proficiency. If Math. 251 is taken, then Math. 252 should also be taken. Selection of elective courses should be made in consultation with a departmental adviser and should be based on the student's interests and goals. More detailed information on recommended courses is available in the Department of Mathematics.

Courses of Instruction in Mathematics (Math.)

Pre-College

2. *Algebra.* I, II. 3 hr. PR: 1 unit algebra. Credits earned in Math. 2 are not counted in the 128 hours required for graduation by the College of Arts and Sciences. *(The Math. 2 course is being phased out. It will be replaced by a non-credit, non-graded, student-funded Pre-College Algebra Workshop, which is designed specifically to prepare students for College Algebra.)*

Lower Division

3. *College Algebra.* I, II. 3 hr. PR: 1½ units algebra or Math. 2, and 1 unit geometry, and satisfactory performance on departmental placement examination. *(Not open to students who have credit for the equivalent of Math. 14.)*

4. *Plane Trigonometry.* I, II. 3 hr. PR: 1½ units of algebra of Math. 2, and 1 unit geometry. *(Not open to students who have credit for the equivalent of Math. 14.)*

11. *Symbolic Logic 2.* I, II, S. 3 hr. PR: Phil. 10. A continuation of Phil. 10, but branching into applications, analogues and alternative systems of logic. Topics include relational predicate logic, identity, definite descriptions; Boolean algebras; switching circuits; modal, many-valued and other alternative logics; philosophical applications. *(Equiv. to Phil. 11.)*

14. *Pre-Calculus Mathematics.* I, II. 4 hr. PR: 2 units algebra and 1 unit geometry, and satisfactory performance on departmental placement test. *(Not open to students who have credit for the equivalent of either Math. 3 or 4.)* A treatment of algebra, analytic geometry, and trigonometry necessary for the study of calculus.

15. *Calculus.* I, II, S. 4 hr. PR: 2 units algebra, 1 unit geometry, ½ unit trigonometry, and satisfactory performance on departmental placement test or Math. 3 and 4 or Math. 14. Introduction to limits, continuity, derivatives, antiderivatives, definite integrals, and applications of the derivative.

16. *Calculus.* I, II, S. 4 hr. PR: Math. 15. Techniques of integration, applications of the definite integral, polar coordinates, indeterminate forms, infinite series.

17. *Applied Mathematics 1.* I, II, S. 4 hr. PR: Math. 16. Introduction to solid analytic geometry, vector algebra, matrix algebra, calculus of several variables.

18. *Applied Mathematics 2.* I, II, S. 4 hr. PR: Math. 17. Ordinary differential equations, LaPlace transforms, partial differential equations, Fourier series, applications.

23. *Introductory Concepts of Mathematics.* I, II. 3 hr. *(Designed for non-science majors who do not need the techniques of mathematics for other course work in their programs.)* Topics in modern mathematics.

28. *Finite Mathematics.* I, II. 3 hr. PR: Two years high school algebra or Math. 3. Logic, sets, partitions, probability theory, vectors, matrices, linear programming and applications in commerce.

33. *Introductory Mathematics for Elementary Teachers.* I, II. 3 hr. PR: 1 unit high school algebra. *(For elementary education majors only.)* Structure of the number systems, techniques of arthimetic computation derived from the properties of the real number system.

34. *Introductory Mathematics for Elementary Teachers.* I, II. 3 hr. PR: Math. 33. *(For elementary education majors only.)* Techniques of arithmetic computation derived from the properties of the real number system, logic, informal, geometry and the metric system.

Upper Division

113. *Differential Equations*. I, II. 3 hr. PR: Math. 18. Analysis of ordinary differential equations including: existence and uniqueness of solutions; methods of solution; oscillatory, stability and asymptotic properties of solutions; boundary value problems, linear and nonlinear systems.

123. *Discrete and Numerical Methods*. I. 4 hr. PR: C.S. 2, Math. 16, Stat. 101 (or Conc.). Set algebra, propositional logic and applications to circuits. Directed and undirected graphs, trees, errors in numerical computation, interpolation, quadrature, solution of nonlinear and differential equations, finite Markov chains, queuing theory. *(Equiv. to C.S. 120.)*

125. *Theory of Games*. II. 3 hr. PR: Math. 16 or consent. Elements of matrix algebra and probability. Theory of games, including decision theory, linear and dynamic programming, and strategy. *(Course will not be offered in 1983-84.)*

128. *Introduction to Calculus*. I, II. 3 hr. PR: Math. 3 or 14 or consent. *(For students in other disciplines needing calculus for applications.)* Limits of sequences and functions, continuity, derivatives, and integrals of polynomials, rational functions, and exponential and logarithmic functions, partial derivatives, maxima and minima.

131. *Algebra Geometry for Elementary Teachers*. I, II. 3 hr. PR: Math. 33 and 34. *(For elementary education majors only.)* Algebra, real numbers and geometry applied to graphing, problem solving, probability and statistics, calculations, and the computer.

133. *Introductory Modern Algebra for Teachers*. I. 3 hr. PR: Calculus or consent. *(Not open to students with credit for Math. 141.)* The basic number systems, decomposition of integers, modular systems, groups, rings, domains, fields, polynomial rings, matrices, vector spaces, linear transformations.

138. *Modern Geometry for Teachers*. I. 3 hr. PR: Math. 16 or consent. *(For prospective high school mathematics teachers.)* Foundations of geometry. Special topics from Euclidean, projective, and non-Euclidean geometries.

141. *Introduction to Algebraic Structures*. I. 3 hr. PR: Math. 163 or consent. A study of groups, rings, and fields together with their substructures, quotients and products, morphisms; the fundamental homomorphism theorems.

143. *Introduction to Linear Algebra*. II. 3 hr. PR: Math. 17. Introduction to vector spaces as an algebraic system. Emphasis on axiomatic development and linear transformations. Examples from geometry and calculus.

161. *Mathematical Logic 1*. I. 3 hr. PR: Phil. 10 or consent. The axiomatic method, "naive," and axiomatic set theory, Russell's Paradox, infinity and uncountability, the "reduction" of mathematics to set theory, introduction to the consistency and completeness of logic, and Godel's proof of the incompleteness of arithmetic. *(Equiv. to Phil. 161.)*

163. *Introduction to the Concepts of Mathematics*. I, II. 3 hr. PR: Math. 16 or consent. Elementary logic, basic theory, relations and functions, equivalence relations and decomposition of sets, order relations, cardinality. Emphasis on learning to prove theorems.

168. *History of Mathematics*. II. 3 hr. PR: Math. 15. Development of mathematics through calculus, with emphasis on mathematical theories and techniques of each period and their historical evolution.

181. *Topology*. II, S. 3 hr. PR: Math. 163 or consent. Introduction to metric and topological spaces. Topics include: continuity, convergence, separation, compactness, and connectedness.

213. *Partial Differential Equations.* II. 3 hr. PR: Math. 113 or consent. Introduces students in mathematics, engineering, and the sciences to methods of applied mathematics. First and second order equations, canonical forms, wave, heat and Laplace's equations, representation of solutions.

215. *Applied Modern Algebra.* II. 3 hr. PR: Consent. Introduction to graph theory, Boolean algebras, monoids, finite-state and Turing machines with applications to computer design, algebraic coding theory and computer language, especially ALGOL.

217. *Applied Mathematical Analysis.* II. 3 hr. PR: Math. 18. The algebra and differential calculus of vectors, solution of the partial differential equations of mathematical physics, and application of functions of a complex variable.

219. *Seminar in Applied Mathematics.* I, II. 1-12 hr.

220. *Introduction to Numerical Analysis 1.* I. 3 hr. PR: Math. 16 and C.S. 120 or consent. Solutions of equations, interpolation, and approximations. Numerical differentiation and integration. Numerical solution of initial value problems in ordinary differential equations. *(Equiv. to C.S. 220.)*

221. *Introduction to Numerical Analysis 2.* II. 3 hr. PR: Math. 220 and 241 or consent. Solutions of linear systems by direct and iterative methods. Matrix inversion, evaluation of determinants, and calculation of eigenvalues and eigenvectors of matrices. Applications to boundary value problems in ordinary differential equations. *(Equiv. to C.S. 221.)*

224. *Mathematics of Compound Interest.* I. 3 hr. PR: Math. 16 or 128. A problem-solving course focusing on the measurement of interest, annuities, amortization schedules, and sinking funds, and the valuation of bonds and other securities.

226. *Mathematical Statistics.* II. 3 hr. PR: Math. 16 or consent. *(Designed for mathematics teachers.)* Frequency distributions, averages, probability, populations, samples, probability distributions, estimations, hypothesis testing. Although no previous knowledge of computer language is assumed, the computer will be used in this course.

231, 232. *Introduction to Mathematics for the Elementary Teacher.* I, II. 3 hr. per sem. PR: Math. 34 or consent. *(Not open to students who have credit for Math. 131.) (For in-service elementary mathematics teachers.)* Systems of numeration; sets, relations, binary operations, the algebraic structure of various number systems; the notions of length, area, and volume; coordinate geometry. *(Course will not be offered in 1983-84.)*

239. *Elementary Number Theory.* II, S. 3 hr. PR: Math. 16 or 131 or consent. Divisibility, congruences, linear and quadratic diophantine equations, number theoretic functions, and applications of number theory to other areas of mathematics. *(Course will not be offered in 1983-84.)*

241. *Applied Linear Algebra.* I, II. 3 hr. PR: Math. 18. Matrix algebra with emphasis on algorithmic techniques and applications to physical models. Topics include solution of large systems of equations, orthogonal projections and least squares, and eigenvalue problems.

251, 252. *Introduction to Real Analysis.* I, II. 3 hr. per sem. PR: Math. 163 or consent. A study of sequences, convergence, limits, continuity, definite integral, and derivative, differentials, functional dependence, multiple integrals, sequences and series of functions.

255. *Advanced Real Calculus.* S. 3 hr. PR: Math. 18 or consent. Limits, series, metric spaces, uniformity, integrals.

256. *Complex Variables*. II. 3 hr. PR: Math. 18. Complex numbers, functions of a complex variable; analytic functions; the logarithm and related functions; power series; Laurent series and residues; conformal mapping and applications.

269. *Advanced Topics in Mathematics*. I, II, S. 3-9 hr. PR: Consent. An independent but directed study program the content of which is to be mutually agreed upon by the individual student and instructor.

271. *Projective Geometry*. II. 3 hr. PR: Math. 141, 241, or consent. Projective and affine spaces, transformation groups for planes. Introduction to axiomatic plane geometries. *(Course will not be offered in 1983-84.)*

291, 292. *Theory of Probability*. I, II. 3 hr. per sem. PR: Math. 18. Fundamental theorems. Development of density and distribution functions in the discrete and continuous cases. Classical problems and solutions. Moments, characteristics functions, limit theorems. Applications.

Medieval and Renaissance Studies

See Interdepartmental Majors, page 91.

Musical Arts

See Interdepartmental Majors, page 91.

Philosophy

Faculty

Henry L. Ruf, Ph.D. (Emory U.), *Chairperson and Professor.*
Ralph W. Clark, Ph.D. (U. Colo.), *Associate Professor.*
Theodore M. Drange, Ph.D. (Cornell U.), *Professor.*
William S. Haymond, Ph.D. (St. Louis U.), *Professor.*
Virginia H. Klenk, Ph.D. (U. Pitt), *Associate Professor.*
Patricia S. Long, M.A. (WVU), *Lecturer (part-time).*
Dennis M. Lynch, M.A. (U. Pitt), *Assistant Professor.*
Mark R. Wicclair, Ph.D. (Columbia U.), *Assistant Professor.*

Program

Philosophy 1 through Phil. 91 are primarily designed for lower-division students as self-contained liberal arts humanities courses. In small lecture-open discussion classes the student is aided to develop skills in thinking and reasoning properly and in asking deeper and deeper questions about some of the most profound and challenging problems confronting human intellect today. The courses provide an excellent way to break away from high school into the collegiate intellectual atmosphere.

The major in philosophy is designed for students who want to go on into law, theology, journalism, public administration, social work, or business, as well as for those students who want to do graduate work in philosophy. The students gain advanced skills in analysis and argumentation, a thorough knowledge of the philosophical foundations of western civilization, and advanced awareness of the ethical implications of contemporary life. Often the philosophy major will carry a second major in an allied field.

Requirements for Philosophy Major

Hours. Majors in philosophy are required to take 30 hours in philosophy including 18 hours of upper-division work. In addition, all majors are required to take a coherent program of 12 hours of upper-division study in

courses approved by the major's adviser in one or more areas outside of philosophy which are judged to be most relevant to the student's particular interest in philosophy.

Required Courses. Each major is required to earn at least a C in each of the following courses: Phil. 1 or 10, 20, 21, 108, 171. Majors planning to do graduate work in philosophy are strongly urged to take Phil. 106.

Courses of Instruction in Philosophy (Phil.)

Lower Division

1. *Introduction to Critical Reasoning.* I, II, S. For students who want to improve their ability to recognize fallacious patterns of reasoning in ordinary discourse and to construct acceptable deductive and inductive arguments. Formal proof techniques will be introducted only when absolutely essential.

3. *Introduction to Philosophy.* I, II. S. 3 hr. The field of philosophy, examining at an elementary level typical problems, issues, areas and/or methods.

4. *Introduction to Ethics.* I, II, S. 3 hr. An elementary examination of such issues as the way we ought to live, the nature of the best life, the just society and our moral responsibilities. Such major philosophers as Plato, Aristotle, Aquinas, Kant, and Mill will be studied.

5. *Logic for Debate.* I, II, S. 3 hr. An elementary course aimed at teaching students to think on their feet by having them debate in class the current national collegiate debate topic.

10. *Symbolic Logic 1.* I, II, S. 3 hr. An introduction to modern symbolic logic (basically, propositional logic and the predicate calculus) for students who want to acquire the skill to represent symbolically the form of deductive arguments and to test formally for validity.

11. *Symbolic Logic 2.* I, II, S. 3 hr. PR: Phil. 10. Continuation of Phil. 10, but branching into applications, analogues and alternative systems of logic. Topics include relational predicate logic, identity, definite descriptions; Boolean algebras; switching circuits; modal, many-valued and other alternative logics; philosophical applications. *(Equiv. to Math. 11.)*

13. *Current Moral Problems.* I, II. 3 hr. An elementary, philosophical examination of moral issues arising in such areas of current concern as paternalism, abortion, euthanasia, contractual obligations, due process, civil rights, war, economic justice, punishment, and civil disobedience.

15. *Introduction to Aesthetics.* I or II. 3 hr. An elementary examination of philosophical problems associated with the nature of beauty, the nature of the arts, and the justification of aesthetic evaluation.

17. *Philosophy of Games.* I, II, S. 3 hr. Definition of "game"; value of games; games as art, science, profession, symbol, education tool, etc. Game theory: its applications and conceptual periphery. Social aspects of play and leisure.

20. *History of Ancient Philosophy.* I. 3 hr. An introduction to the major philosophies of the Western world from pre-Socrates to Plontinus.

21. *History of Modern Philosophy.* II. 3 hr. An introduction to the major philosophies of the Western world from Descartes to Kant.

91. *Special Topics.* I or II, S. 3 hr. *(May not be repeated for credit.)* An elementary examination of a philosophical issue, such as skepticism, freedom, alternative philosophies of life, minds and machines, God and immortality or the nature of man. Topics will vary.

Upper Division

103. *Topics in Medieval Philosophy.* I or II. 3 hr. PR: 3 hr. philosophy or history major or consent. Study of selected topics in the major philosophies of the Western world from Augustine to William of Occam.

105. *History of Recent Philosophy.* I or II. 3 hr. PR: 3 hr. philosophy or consent. A critical study of the major Western philosophers and philosophic movements in the nineteenth and early twentieth centuries including post-Kantian idealism, Marxism, Schopenhauer, existentialism, pragmatism, positivism, and neo-realism.

106. *Mathematical Logic 1.* I. 3 hr. PR: Phil. 10 or consent. Axiomatic method, "naive" and axiomatic set theory, Russell's Paradox, infinity and uncountability, "reduction" of mathematics to set theory, introduction to consistency and completeness of logic, Godel's proof of the incompleteness of arithmetic. *(Equiv. to Math. 161.)*

108. *Ethical Theory.* I or II. 3 hr. PR: 3 hr. philosophy or consent. A critical study of the meaning of moral concepts, the problems of rules of moral reasoning, criteria of moral truth, and the nature of moral rights, duties, and obligations.

111. *American Philosophy.* I or II. 3 hr. PR: 3 hr. philosophy or history or English major or consent. A study of the ideas and movements in American philosophical thought from Colonial times to the early twentieth century, including such topics as the American enlightenment, transcendentalism, social Darwinism, idealism, and pragmatism.

113. *Russian Philosophy.* I or II. 3 hr. PR: 3 hr. philosophy or Russian concentrate or consent. A critical, historical study of Russian philosophy from the time of the eighteenth century Russian Socrates (Skovoroda) down to the time of the Russian Marxists (Plekhanov, Boganov, Lenin, and Axelrod.)

121. *Existentialism.* I or II. 3 hr. PR: 3 hr. philosophy or literature course in existentialism or consent. Survey of the major existentialist thinkers.

122. *Philosophies of Asia.* I or II. 3 hr. PR: 3 hr. philosophy or consent. A critical, historical examination of the writing of the classic philosophers of India and China.

123. *Philosophy of Religion.* I or II. 3 hr. PR: 3 hr. philosophy or religious studies concentrate or consent. The nature of religious faith, the nature and existence of God, and the grounds of religious conviction.

150. *Social and Political Philosophy.* I or II. 3 hr. PR: 3 hr. philosophy or political science major or consent. Application of moral concepts to questions concerning the individual and the state.

158. *Philosophy of Science.* I or II. 3 hr. PR: 3 hr. philosophy or science major or consent. Philosophical problems associated with the concepts and methodology of science.

159. *Philosophy of the Social Sciences.* I or II. 3 hr. PR: 3 hr. philosophy or major in one of the social sciences or consent. Philosophical problems associated with the concepts and methodology of the social sciences.

166. *Metaphysics.* I or II. 3 hr. PR: Phil. 1, 3, or consent. Traditional problems associated with reality and experience, universals and particulars, causality, space and time, matter and mind, and the nature of the self.

171. *Theory of Knowledge.* I or II. 3 hr. PR: Phil. 1, 10 or 106 or consent. A critical analysis of the concept of knowledge and an examination of various forms of philosophical skepticism (skepticism about perception, memory, introspection, induction).

187. *Philosophy of Mind.* I or II. 3 hr. PR: Phil. 3, 21, or psychology major or consent. The nature of mind and its relation to the body. Other minds. Analysis of mental concepts.

190. *Teaching Practicum.* I, II. 3 hr.

195. *Field Experience (Debate).* I, II. 3 hr.

253. *Philosophy of Mathematics.* I or II. 3 hr. PR: Phil. 106 or consent. Contemporary viewpoints in the foundations of mathematics. *(Course will not be offered in 1983-84.)*

272. *Philosophy of Law.* I or II. 3 hr. PR: 6 hr. in philosophy or law or pre-law student or consent. A philosophical, metatheoretical study of legal theorizing, a metaphysical investigation of the presuppositions of legal claims and an application of philosophical ethics to legal practices, concentrating on recent studies by philosophical analysts.

283. *Philosophy of History.* I or II. 3 hr. PR: 6 hr. in philosophy or history major or consent. Theoretical problems such as the nature of historical explanation, relativism, and the status of speculative principles of history.

285. *Philosophy of Language.* I or II. 3 hr. PR: 6 hr. in philosophy or linguistic or language major or consent. Philosophical problems concerning the nature of meaning and language.

290. *Directed Studies.* I, II, S. 1-6 hr. *(May be repeated for credit.)* PR: Instructor's written consent. Individually supervised reading, research, and projects.

292. *Advanced Topics in Philosophy.* I or II. 3 hr. PR: 6 hr. in philosophy or consent. Advanced philosophical investigation of selected problems and issues. Topics will vary.

Physical Science

Fred M. Goldberg, Ph.D. (U. Mich.), *Coordinator of Physical Science Program and Associate Professor of Physics.*
Bruce Perry, Specialist (U. N. Iowa), *Visiting Instructor.*
Marlene Fuhrman, M.S. (U. Iowa), *Visiting Instructor.*

The Physical Science Program offers two sequences of introductory-level laboratory courses designed especially for the nonscience major. The introductory courses help students develop inquiry skills in science. During class, students work in pairs doing activities, performing simple experiments, and solving problems. There is a significant amount of discussion between the instructor and individual students. This approach would be particularly beneficial for students preparing to teach because it will help develop confidence in teaching science. There are four hours of laboratory-discussion and one hour of lecture-discussion each week.

The guided design approach teaches students skills that will help them make decisions concerning environmental and other science-related issues and problems that the students will face as citizens. When focusing on the open-ended problems, students work in small groups and are guided in their discussions by instruction and feedback materials. There are three hours of lecture-discussion and two hours of laboratory-discussion each week.

Courses of Instruction in Physical Science (P. Sci.)

Lower Division

1. *Introductory Physical Science.* I, II. 4 hr. Emphasis on practicing reasoning abilities necessary to carry out simple scientific inquiry. Major concepts include properties of matter and astronomy. Majority of class time is spent in laboratory activities and solving problems using an activity-based approach.

2. *Introductory Physical Science*. I, II. 4 hr. PR: P. Sci. 1. Continuation of P. Sci. 1. Concepts include electricity, motion, heat and temperature, energy, and chemistry.

11. *Guided Design Physical Science*. I, II. 4 hr. Emphasis on learning physics and astronomy and science laboratory skills in the context of solving open-ended, science-related problems, such as the energy crisis, and searching for extraterrestrial intelligence.

12. *Guided Design Physical Science*. II. 4 hr. PR: P. Sci. 11. Continuation of P. Sci. 11 with special emphasis on solving environmental problems in chemistry (water pollution), geology (locating a sanitary landfill), and meteorology.

Upper Division

190. *Teaching Practicum in Physical Science*. I, II. 1-3 hr. per sem. PR: P. Sci. 1 and 2 and consent. Opportunity to help teach an activity-based science course under the direction of experienced instructors. Emphasis on developing inquiry teaching skills useful for all levels of classroom instruction.

Physics

Faculty

William E. Vehse, Ph.D. (Carnegie-Mellon U.), *Chairperson and Professor.*
Atam P. Arya, Ph.D. (Penn St. U.), *Professor.*
Bernard R. Cooper, Ph.D. (U. Cal.), *Claude Worthington Benedum Professor of Physics.*
Stanley Farr, M.S. (WVU), *Associate Professor Emeritus.*
Martin V. Ferer, Ph.D. (U. Ill.), *Professor.*
Fred M. Goldberg, Ph.D. (U. Mich.), *Associate Professor.*
Oleg Jefimenko, Ph.D. (U. Ore.), *Professor.*
Arnold D. Levine, Ph.D. (Columbia U.), *Professor.*
John E. Littleton, Ph.D. (U. Rochester), *Associate Professor.*
Milton E. McDonnell, Ph.D. (U. Del.), *Assistant Professor.*
Pedro A. Montano, D.Sc. (Technion), *Professor.*
Arthur S. Pavlovic, Ph.D. (Penn St. U.), *Professor.*
Carl A. Rotter, Ph.D. (Case Tech.), *Professor.*
Mohindar S. Seehra, Ph.D. (U. Rochester), *Professor.*
Richard P. Treat, Ph.D. (U. Cal.), *Professor.*
Miguel Jose-Yacaman, Ph.D. (Nat'l. U. Mexico), *Associate Professor.*
Douglas B. Williamson, Ed.D. (Columbia U.), *Associate Professor Emeritus.*

Programs

The programs and courses offered in physics are designed to lay a foundation for professional training of physicists, and to meet the needs of students majoring in areas where a background in physics is desirable. The department also offers courses of interest and value to a broad range of students in areas of general physics, education, physical science, photography, astronomy, meteorology, health sciences, and the fine arts.

Major in Physics—B.S.

The degree of Bachelor of Science (B.S.) is intended for students who want to qualify for professional positions in industry, education, medicine, and government, as well as for those who plan to do graduate work in physics or related areas; 136 hours are required subject to the general exclusions for all degrees. A cumulative average of 2.0 for all physics courses is required. Admission to the program requires, in addition to college requirements, that the student have at least a 2.5 grade-point average in all required Physics courses (which must include Phys. 11, Phys. 12, and Math. 15, Math. 16, or their equivalents). Continuance for subsequent semesters requires, in

addition to college requirements, that the student maintain at least a cumulative 2.2 grade-point average in all physics and mathematics courses.

Required Courses

Orientation 1 (Physics Section), Phys. 11, 12, 124, 231, 233, 234, 241, 251, 263, 271, 283; electives (6 hr.): Math. 15, 16, 17, 18, elective (3 hr.); science (8 hr.); early departmental advising is strongly encouraged to assist in setting up a program for each student.

Recommended Electives

Designed to meet the needs of the individual student; a well-planned program might combine a fundamental background in physics with preparation for an advanced degree in a related area.

Honors Program

Qualified students with a cumulative grade-point average of at least 3.0 in physics courses may obtain a B.S. in Physics with honors by carrying out a physics-related project in addition to the required courses. The project results in the form of a written report must be approved by a committee composed of three faculty members chosen by the student, at least two of whom are from the Department of Physics. Students should register for at least 2 hours of credit in the honors section of Phys. 201.

The undergraduate adviser serves as the department director for the Honors Program.

Courses of Instruction in Physics (Phys.)

Lower Division

1. *Introductory Physics.* I, II. 4 hr. PR: Plane geometry and algebra. The fundamental philosophy and principles of physics are applied to studies of mechanics, sound, heat, and thermodynamics through demonstrations, problems, and experiments.

2. *Introductory Physics.* I, II. 4 hr. PR: Phys. 1. The fundamental philosophy and principles of physics are applied to studies of electricity, magnetism, optics, light, and atomic and nuclear physics through demonstrations, problems, and experiments.

7. *Physics of Music.* I. 3 hr. *(For students of the liberal and fine arts as well as science and engineering majors.) (No science or music prerequisites.)* The physical and psychophysical principles underlying the nature, production, transmission, reception, and reproduction of sound.

8. *Light, Vision, and Color.* II. 3 hr. *(For students in liberal and fine arts.)* Descriptive course emphasizing the basic principles of light with applications to color vision, and optical phenomena occurring in everyday environment and technology.

11. *General Physics.* I, II. 4 hr. PR: A grade of C or better in Math. 15. *(Not open to students who have credit for Phys. 1.)* Survey of classical mechanics, thermodynamics, and waves.

12. *General Physics.* I, II. 4 hr. PR: Phys. 11. *(Not open to students who have credit for Phys. 2.)* Survey of electricity, magnetism, and optics.

Upper Division

116. *Photography.* I, II. 3 hr. Physics and chemistry of photography with practical application.

117. *Descriptive Meteorology*. II. 3 hr. PR: 1 year college physics or physical science. The atmosphere and its weather. Reading and analysis of weather maps. Weather observations. Special topics of current or particular interest.

124. *Elementary Modern Physics*. II. 4 hr. PR: Phys. 12, Math. 16. Topics of modern physics of interest to science majors and engineers; atomic and molecular structure and spectra, solid state and nuclear physics, relativity, and elementary particles.

201. *Special Topics*. I, II. 1-6 hr. per sem. *(May be repeated to max. of 24 hours.)* Study of topics of current interest in physics.

225. *Atomic Physics*. I, II. 3 hr. PR: Phys. 124 or equiv. Relativistic mechanics, atomic structure, and spectra.

231, 232. *Theoretical Mechanics*. I, II. 3 hr. per sem. PR: Phys. 11, 12 or equiv.; Conc.: Math. 18. Scalar, vector, and tensor fields; curvilinear coordinate systems. Kinematics and dynamics of particles, systems of particles and rigid bodies. Lagrangian and Hamiltonian formulation. Relativistic motion.

233, 234. *Electricity, Magnetism, and Radiation Optics*. I, II. 3 hr. per sem. PR: Phys. 11, 12 or equiv.; Conc.: Math. 18. Electrostatics, magnetostatics, introduction to electrodynamics, and applications to optics.

241. *Advanced Physics Laboratory*. I, II. 1-2 hr. per sem. PR: Phys. 11, 12, 124. Experiments in physics designed to implement theory courses, give experience in data taking and instrumentation, and learn methods of data evaluation and error analysis.

248. *Physics Seminar*. I, II. (No Credit.) *(Suggested for junior, senior, and graduate Physics majors.)* These lectures acquaint students with topics of current interest in physics.

251. *Introductory Quantum Mechanics*. I. 3 hr. PR: Phys. 124, Math. 18. Fundamental principles of quantum mechanics; state functions in position and momentum space, operators, Schrodinger's equation, applications to one-dimensional problems, approximation methods, the hydrogen atom, angular momentum and spin.

263. *Nuclear Physics*. I, II. 3 hr. PR: Phys. 124; Math. 17. Study of characteristic properties of nuclei and their structure as inferred from nuclear decays and reactions, leading to a knowledge of nuclear forces and models.

271. *Solid State Physics*. II. 3 hr. PR: Phys. 124 or equiv.; Math. 17. Properties of crystalline solids; includes crystal structure, binding, lattice vibrations and an investigation of thermal, electrical, magnetic, and optical phenomena based on energy band theory.

283. *Thermodynamics*. II. 3 hr. PR: Phys. 11, 12 or equiv.; Math. 17. Introduction to the statistical foundations of thermodynamics. Application of the fundamental laws of thermodynamics to physical and chemical systems.

301. *Special Topics*. I, II. 1-6 hr. per sem. *(May be repeated to max. of 24 hours.)* PR: Consent. *(Primarily for Graduate students.)* Specialized topics of current interest in physics.

313. *Introductory Electronics*. S. 3 hr. PR: 1 year college physics. *(Primarily for Education majors; not open to Physics majors.)* Principles and applications of electrical components and circuits, including solid-state electronics.

321. *Optics*. I, II. 3 hr. PR: Phys. 11, 12 or equiv.; Math. 17. A basic course in physical optics covering radiation theory, diffraction, interference, polychromatic waves, scattering, polarization, double refraction, and selected topics in quantum optics.

325. *Advanced Atomic and Molecular Physics.* I. 3 hr. PR: Phys. 351. Advanced quantum theory of atoms and molecules. Detailed treatment of group theoretical background necessary for treating symmetry considerations in quantum mechanics.

331. *Advanced Classical Mechanics.* I. 3 hr. PR: Phys. 231, 232, and differential equations. Lagrange and Hamilton form of equations of motion, rigid bodies, small and nonlinear oscillations. Transformation theory, relativistic dynamics, and systems with an infinite number of degrees of freedom.

333, 334. *Advanced Electricity and Magnetism.* I, II. 3 hr. per sem. PR: Phys. 233, 234, and differential equations. Electrostatic and magnetostatic boundary value problems. Maxwell's equations for time varying fields. Green's functions and integral responsibilities; applications to radiation, diffraction, wave guides, plasma physics, and relativistic motion of charged particles.

351, 352. *Quantum Mechanics.* I, II. 3 hr. per sem. PR: Phys. 124. Covers a wide range of topics of current interest at a level such that a student should be able to read basic research papers in many fields upon completion. Topics covered include: approximation methods, representation theory, angular momentum, relativistic quantum mechanics, time dependent perturbation theory, identical particles, scattering, molecules, solids, magnetism, and second quantization of bosons and fermions.

354. *Introduction to Modern Physics.* S. 3 hr. PR: One year introductory college physics. *(Primarily for Education majors; not open to Physics majors.)* Elementary study of atomic and molecular structures and spectra, solid state and nuclear physics, relativity and elementary particles.

355, 356. *Workshop for Physics Teachers.* S. 3 hr. per sem. PR: One year college physics; one year college mathematics. *(Primarily for Education majors; not open to Physics majors.)* Techniques of apparatus construction and demonstration.

357. *Photography.* SI. 3 hr. PR: One year college physics or equiv. *(Primarily for Education majors; not open to Physics majors.)* The physics and chemistry of photography with practical experience.

358. *Light.* SII. 3 hr. PR: One year college physics or equiv. *(Primarily for Education majors.)* A demonstration course designed to illustrate the basic concepts covering light and optics.

383. *Statistical Mechanics.* II. 3 hr. PR: Phys. 283, 352. Classical statistics; Boltzman, Fermi-Dirac, and Bose-Einstein statistics, theory of fluctuations and applications to physical systems.

387. *Mathematics for Physicists and Engineers.* I. 3 hr. PR: Calculus, differential equations, Phys. 11, 12 or equiv. Complex variables: series, contour integration and conformal mapping; ordinary differential equations; Fourier Series; Laplace transforms, Fourier transforms; special functions; Bessel functions and Legendre, Hermite, and Laguerre polynomials; introduction to partial differential equations; Poisson's equation, Wave equation, and diffusion equation.

388. *Mathematics for Physicists and Engineers.* II. 3 hr. PR: Phys. 387 or equiv. Infinite dimensional linear vector spaces; series and Green's function methods of solution of partial differential equations; variational methods. Applications in electricity and magnetism, fluid mechanisms, diffusion heat flow, propagation, and scattering phenomena.

Courses of Instruction in Astronomy (Astro.)

Upper Division

106. *Descriptive Astronomy.* I, II. 3 hr. The celestial sphere, star time, solar time, Kepler's laws, H-R diagram and modern developments. No mathematics used; only simple geometrical arguments employed.

216. *Astronomy for Teachers*. S. 3 hr. PR: Consent. Basic concepts and methods in astronomy and how to teach them using the celestial sphere and geometrical tools. Observational work at night. The use of a telescope and camera.

267. *Basic Astrophysics*. I, II. 3 hr. PR: Phys. 124 or equiv. The several equations of state, the Boltzmann-Saha equation, the H-R diagrams and interpretation of spectra, introduction to radiative transfer and stellar structure.

Political Science

Faculty

Orrin B. Conaway, Jr., Ph.D. (Syracuse U.), *Chairperson and Claude Worthington Benedum Professor of Political Science.*
David A. Bingham, Ph.D. (U. Iowa), *Professor.*
Fredric N. Bolotin, Ph.D. (SUNY—Binghamton), *Visiting Assistant Professor.*
Marion F. Dearnley, J.D. (SUNY—Buffalo), *Adjunct Assistant Professor.*
Robert E. DiClerico, Ph.D. (Ind. U.), *Associate Professor.*
D. Lyn Dotson, J.D. (WVU), *Adjunct Assistant Professor.*
Carl M. Frasure, Ph.D. (Ohio St. U.), *Professor Emeritus.*
Royal C. Gilkey, Ph.D. (U. Minn.), *Professor.*
Allan S. Hammock, Ph.D. (U. Va.), *Associate Chairperson; Associate Professor.*
Nand Hart-Nibbrig, Ph.D. (U. Calif.), *Adjunct Associate Professor.*
David M. Hedge, Ph.D. (U. Wisc.), *Assistant Professor.*
John A. Jacobsohn, Ph.D. (U. Md.), *Associate Professor.*
Hong N. Kim, Ph.D. (Georgetown U.), *Professor.*
Donald C. Menzel, Jr., Ph.D. (Penn St. U.), *Professor.*
Herman Mertins, Jr., Ph.D. (Syracuse U.), *Adjunct Professor.*
Sophia L. Peterson, Ph.D. (UCLA), *Professor.*
Gerald Pops, Ph.D. (Syracuse U.), *Adjunct Professor.*
George W. Rice, Ph.D. (Ohio St. U.), *Professor.*
Suzanne Stenzel, Ph.D. (U. Pitt), *Adjunct Assistant Professor.*
Irvin Stewart, Ph.D. (Columbia U.), *President Emeritus of West Virginia University.*
David G. Temple, Ph.D. (U. Va.), *Professor.*
David J. Webber, Ph.D. (Ind. U.), *Assistant Professor.*
James B. Whisker, Ph.D. (U. Md.), *Professor.*
Herbert G. Wilcox, Ph.D. (NYU), *Professor.*
David G. Williams, Ph.D. (SUNY—Albany), *Adjunct Professor.*
John R. Williams, Ph.D. (Duke U.), *Professor.*
Harvey Wolf, D.P.A. (U. Sou. Calif.), *Adjunct Associate Professor.*
Rodger D. Yeager, Ph.D. (Syracuse U.), *Associate Professor.*

Program

The undergraduate curriculum in the Department of Political Science is designed to achieve four main objectives. These are:

1. To acquaint students with the nature and role of government in modern society, thus contributing to the general education of the student. In order to achieve this objective, the department offers the *General Political Science Track*. This track is open to any student who has a general interest in political science but who has not yet focused on a specific career goal.

2. To impart a basic knowledge and understanding of the public policy making process, including the techniques used by policy analysts and public administrators. To accomplish this objective, the department offers the *Public Affairs Track*. Students having a desire to enter public service and/or who wish to obtain advanced graduate training in Public Administration or Public Policy at WVU, or elsewhere, should enroll in this track. Additional information on the Public Administration and Public Policy M.A., M.P.A., or Ph.D. programs at WVU may be obtained in the *WVU Graduate Catalog*.

3. To provide pre-professional training for students preparing to enter the legal profession. Students interested in law school should enroll in the *Pre-Law Track.*

4. To provide pre-professional training for students preparing to engage in general graduate political science study at the M.A. or Ph.D. levels. Any student preparing for a career in teaching or research should enroll in the *Graduate Political Science Track.* Students desiring a teaching or research career in Public Policy Studies should consider taking either the Graduate Track or the Public Affairs Track.

Major in Political Science

Requirements

1. Students majoring in political science must take a minimum of 30 upper-division hours in political science. At least one course must be selected from each of the following fields: *American Government, Politics and Policy:* Pol. S. 120, 121, 131, 135, 137, 210, 211, 213, 214, 215, 216, 221, 225, 226, 232, 234, 236, 310, 335, 336; *Public Administration:* Pol. S. 140, 240, 242, 244, 246, 341, 343, 345; *Comparative Government and Politics:* Pol. S. 151, 250, 251, 252, 253, 254, 255, 256, 257, 258, 350, 351, 355; *International Relations:* Pol. S. 160, 261, 263, 264, 266, 267, 268, 269, 360; *Political Theory:* Pol. S. 270, 271, 272, 273, 275, 279, 370.

2. The department also offers three courses that deal with the scope of political science and the various techniques employed by political scientists to investigate and analyze political data: Pol. S. 100, 200, and 300. Pol. S. 100 is required of all majors. Pol. S. 200 is required in the Graduate Political Science Track. Pol. S. 300, while designed for graduate students, may be taken by advanced undergraduates. All three courses count toward the 30 hours required of political science majors.

3. Students may also arrange to take selected special courses dealing with a special topic or involving experiential learning. These courses are scheduled on both a group and a tutorial basis with individual faculty members. Courses available for this type of instruction are: Pol. S. 188, 189, 191, 195, 196, and 299. These courses also count toward meeting the 30 hours required in political science.

4. Political science majors must also take 12 hours in a minor field. The choice of a minor field depends on the interest of the student and the particular track in which the student is enrolled. Minor fields available include: economics, geography, history, philosophy, psychology, sociology and anthropology, statistics and/or computer science, accounting, business, civil engineering, English, industrial engineering, journalism, social work, speech communication, mathematics, foreign languages, and inter-departmental minor.

5. Students having a grade of I (Incomplete) in any political science course must remove the incomplete before departmental certification for graduation.

Track Requirements

Each political science major must enroll in a political science track, depending on his or her academic or career interest. The tracks and the individual requirements of each are:

General Political Science Track (General Liberal Arts)—Pol. S. 1 and 2 (recommended only); Pol. S. 100; Econ. 54-55; 30 upper-division hours in political science courses; and 12 upper-division hours in a minor field.

Public Affairs Track (Public Service Careers)—Pol. S. 1 and 2 (recommended only); Pol. S. 100; Econ. 54-55; 6 hr. selected from the following: Pol. S. 140, 240, 242, 244, 246, 343, 345; 6 hr. selected from the following: Pol. S. 120, 121, 135, 137, 221, 225, 226, 236, 335, 336; 6 hr. selected from the following: Acctg. 51-52, C.S. 1, Stat. 101 (or Econ. 125), Stat. 201; 30 upper-division hours in political science courses; and 12 upper-division hours in a minor field.

Pre-Law Track (Careers in Law)—Pol. S. 1, 2 (recommended only); Pol. S. 100; Econ. 54-55; Acctg. 51-52; Pol. S. 275 (recommended only); C.S. 1, Stat. 101 (or Econ. 125), Stat. 201 (all recommended only); 30 upper-division hours in political science courses; and 12 upper-division hours in a minor field.

Graduate Political Science (Graduate School/Teaching Careers)—Pol. S. 1 and 2 (recommended only); Pol. S. 100, 200; Stat. 101 (or Econ. 125); C.S. 1 and 2 (recommended only); advanced Foreign Language (recommended only for students whose area of interest makes knowledge of a language desirable); 30 upper-division hours in political science courses; and 12 upper-division hours in a minor field.

Honors Program

The Department of Political Science, in cooperation with the University Honors Program, offers courses which are open exclusively to honors students. These courses are listed in the University's *Schedule of Courses* each semester. Students who meet the standards of the University Honors Program may enroll in these courses.

In addition, the Department of Political Science offers honors courses for those who wish to gain departmental honors status. In order to achieve honors in political science a student must: (a) complete at least 15 hours in upper-division political science courses; (b) have a minimum grade-point average of 3.3; and (c) take at least 6 hours in upper-division honors sections of political science courses. Students interested in the Political Science Honors Program should contact the Director of Undergraduate Studies in the Department of Political Science.

Courses of Instruction in Political Science (Pol. S.)

Lower Division

1. *Introduction to Political Science.* I, II, S. 3 hr. Introduction to government. Origins, forms, and functions of the state; organization and forms of government; and the relationships of groups and individuals to the state.

2. *The American Federal System.* I, II. 3 hr. General survey of American national government and politics.

3. *Global Political Issues: An Introduction.* I, II, S. 3 hr. Analyzes significant issues in world politics, e.g., environment, energy, food, population, arms and security, human rights, economic interdependence, and development. It examines the values and policies in conflict, and alternative futures.

7. *Modern Political Ideologies.* I, II. 3 hr. *(Designed especially for nonmajors.)* A survey of some of the major competing ideologies in the modern world, including capitalism, communism, socialism, fascism, and democracy.

50. *Introduction to Comparative Politics.* I, II. 3 hr. *(Designed for beginning students in the field of comparative politics.)* This course surveys basic data, theories, approaches, and analytical skills used in the comparative study of foreign political systems.

100. *Introduction to Political Analysis.* I, II. 3 hr. Application of a range of approaches to the study of politics in each subfield of political science. Each approach is explored for its own presuppositions, direction of bias, and unique questions it poses for the researcher.

120. *State and Local Government.* I, II. 3 hr. The legal basis, structure, politics and operation of state and local governments, their relations with each other, and their place in the federal system.

121. *Introduction to Urban Planning.* I, II. 3 hr. Structure of urban communities; history, processes, and objectives of planning; trends in planning and urban development. *(Course will not be offered in 1983-84.)*

131. *Political Parties and Electoral Processes.* I, II. 3 hr. Nature of political parties. Public regulation of parties and electoral processes. A close examination of suffrage, nominating devices, campaign procedures, and the conduct of elections.

135. *Introduction to Policy Analysis.* I, II. 3 hr. Examination of the causes and consequences of public policies. Substantive policies examined include: civil rights, housing and urban renewal, health, welfare, law enforcement, energy, environment, education, taxation, among others.

137. *Women and Politics, Policy, and Law.* II. 3 hr. The public policy process concerning gender-related issues. Formation of women's interest groups. Women's political participation and office-holding. National policies as formulated in executive orders, congressional legislation, and court cases. Policy implementation and impact.

140. *Introduction to Public Administration.* I, II. 3 hr. The development, organization, procedures, processes, and human relation factors of governmental administration in American democracy.

151. *Contemporary European Governments.* I, II. 3 hr. Comparative analysis of constitutions, political structures, and functions, with major emphasis on the United Kingdom, France, Russia, and West Germany.

160. *International Relations.* I, II. 3 hr. Contemporary world politics. Background to make present-day international affairs more understandable.

188. *Honors Seminar.* I, II. 3 hr.

189. *Selected Topics (Honors.)* I, II. 3 hr.

191. *Special Topics.* I, II, S. 3 hr. Course topics change. Students may enroll more than once.

195. *Field Experience.* I, II, S. 1-18 hr. *(Total credit applicable toward any Arts and Sciences degree may not exceed the maximum of 18 hours.)* PR: Consent for those who wish to work with faculty and field supervisors to design field experience with planned learning objectives and credit goals.

196. *Seminar.* I, II, S. 1-6 hr.

200. *Quantitative Political Analysis.* I, II. 3 hr. PR: Upper-division standing. Course stresses the understanding of methods, theories, and substantive interests identified with behavioral approach to the study of politics. Descriptive statistics and the use of the University of Chicago's Statistical Package for the Social Sciences (SPSS) are included.

210. *The American Presidency.* I, II. 3 hr. Institutional, behavioral, and societal forces which have given rise to the modern presidency; factors which enhance and constrain the exercise of the presidential power over those constituencies with which the president must interact; the nature and consequences of the presidential decision-making process; desirability and/or feasibility of reforming the presidency.

211. *Problems of American National Government.* I, II. 3 hr. An examination of selected problems in American government and politics.

213. *American Constitutional Law.* I. 3 hr. PR: Pol. S. 2 or consent. *(Primarily for juniors and seniors as well as graduate students.)* Basic principles of American constitutional law as developed through court interpretations based on precedents rooted in an English-derived colonial heritage. Special emphasis on the division and separation of powers, the implementation of rights by court decisions expanding their effect through "incorporation," and the strategic significance of judicial review. Major constitutional controversies, as treated by courts and judges, are examined in the light of the facts and from the standpoint of theory in order to reach tenable conclusions as to the role of the judiciary in America. Case method of instruction.

214. *Civil Rights and Liberties in the United States.* II. 3 hr. PR: Pol. S. 213 or consent. The scope and meaning of civil liberty guarantees in the United States Constitution, as illustrated by cases involving original constitutional provisions, the Bill of Rights, and Civil War amendments with special attention to the rule of law; free speech, press, religion, assembly, and petition; personal security; racial discrimination; and the labor problem.

215. *American Constitutional Development 1.* I. 3 hr. PR: Pol. S. 2 or consent. American constitutional development, with special emphasis on origins of constitutionalism here; liberty vs. government; mixed government; separation of powers; problem of federalism and the Philadelphia Convention of 1781; Marshall court and establishment of judical review; Federalist vs. States Rights construction of the Constitution; Jacksonian influences; Taney Court prelude to Civil War, secession, and conflict, heralding constitutional change.

216. *American Constitutional Development 2.* II. 3 hr. PR: Pol. S. 2, 215, or consent. American constitutional development, with special attention to reconstruction, Supreme Court, and Fourteenth Amendment; *laissez-faire* and commerce clause; stirrings of reform toward a constitutional revolution under the New Deal; changing federal-state relationships; impact of war on constitutional interpretation; expanding role of the president in domestic matters and foreign relations; Warren Court, the Burger Court dominated by Nixon-Ford appointed judges.

221. *West Virginia Government and Administration.* I, II. 3 hr. Organization and operation of the state government of West Virginia.

225. *Urban Politics.* I. 3 hr. Legal basis, structure, processes, and politics of urban governments and cooperative-conflict relations with other governmental units.

226. *Problems of State and Local Government.* I, II. 3 hr. PR: Pol. S. 120 or equiv. Change processes in state and local systems in the context of federalism.

232. *Public Opinion and Propaganda.* I, II. 3 hr. The formation, measurement, and impact of public opinion in the American and cross-national contexts.

233. *Current Political Issues.* I. 3 hr.

234. *The Legislative Process.* II. 3 hr. Structure and organization of legislative bodies. Powers of legislature. Detailed study of law-making procedures. Influences of outside forces.

236. *Energy Policy and Politics.* II. 3 hr. An examination of U.S. energy policies and politics, with particular emphasis placed on the development and implementation of energy policies since 1973.

238. *Politics of Environmental Policy.* I. 3 hr. Examines the formulation and evaluation of United States environmental policy.

240. *Public Administration and Social Change.* I, II. 3 hr. PR: Pol. S. 140. The study of government and administrative organization in their relationships to the sources of change—social, cultural, economic, technical, and environmental—in American society.

242. *American Administrative Systems.* I. 3 hr. Analysis of the nature and processes of American public and administrative (political, legal, economic, and social conditions), including the role of the bureaucracy in a democracy. *(Equiv. to Pub. A. 242.)*

244. *Administrative Law and Regulation.* II. 3 hr. PR: Pol. S. 140 or consent. The law of public administration, primarily by case method, covering administrative powers and limitations, procedure in administrative adjudication and rule-making, discretion, ultra vires as check on administrators, notice and hearing, administrative penalties, judicial control, and administrative liability.

246. *Comparative Public Administration.* II. 3 hr. Theory and practice of public administration in diverse cultures and national political systems.

250. *Government of Japan.* II. 3 hr. Survey of political institutions and governmental process of Japan with special emphasis on the analysis of political problems in the post-war period.

251. *Governments of Soviet Union and Eastern Europe.* II. 3 hr. Survey of the political nondemocratic governments of the Soviet Union and its Eastern European satellites, with special reference to the guiding role and development of Marxism-Leninism.

252. *British Government and Politics.* II. 3 hr. Intensive study of British government with emphasis on internal and external policies, primarily during the twentieth century.

253. *Contemporary Governments of the Commonwealth.* II. 3 hr. Political relationships between members of the Commonwealth. Comparative study of governments and politics of the dominions, with particular reference to Canada and Australia.

254. *Government of China.* I. 3 hr. Survey of political institutions and governmental process of Communist China with special emphasis on the analysis of political problems since 1949.

255. *Governments of Latin America.* I. 3 hr. Comparative study of the major nations of Latin America.

256. *Governments of the Middle East.* II. 3 hr. Governments and political forces of the Middle East.

258. *Politics of Africa.* II. 3 hr. Historical legacies and current political processes of tropical African countries.

261. *International Organization.* II. 3 hr. Agencies created since the close of World War II. Some reference to the development of international law and United Nations.

263. *Public International Law.* I. 3 hr. Law governing relations among nations, including development of rules, means of enforcement, and conflicts between theory and practice.

264. *Conduct of American Foreign Relations.* I. 3 hr. Concepts about the factors influencing the formation and execution of United States foreign relations; analysis of past policies and current issue areas in relations with major developed and developing nations and international organizations.

266. *Soviet Foreign Policy.* II. 3 hr. Concepts about the factors influencing the formulation and execution of Soviet foreign relations; analysis of past policies and current issue areas in relations with major developed and developing nations and international organizations.

267. *Latin America in International Affairs.* II. 3 hr. Relations of Latin American states among themselves, with the United States, the United Nations, regional organizations, and nonwestern states. Analysis in depth of the Monroe Doctorine and its corollaries and the inter-American system.

269. *Far Eastern International Relations.* II. 3 hr. International relations of Far Eastern countries with emphasis on historic roots of recent conflicts, the competitive role of the United States and the Soviet Union, confrontation between the communist and anti-communist countries in the region, and the regional cooperation and security problems in the post-war period.

270. *History of Political Thought: Plato to Machiavelli.* I. 3 hr. Major political ideas from the Greeks to the sixteenth century with special emphasis upon development of natural law and the western conception of justice.

271. *History of Political Thought: Machiavelli to Bentham.* II. 3 hr. PR: Pol. S. 270 or consent. Political ideas which developed from the separation of faith and reason, the culmination of this movement in rational integral liberalism, and the origins of modern conservatism as expounded by Edmund Burke.

272. *Recent and Contemporary Political Thought.* I. 3 hr. Examination of intergral liberalism and the forces leading to the decline of liberalism and a critical analysis of the fascist and communist ideologies with their threat to the traditions of western civilization embodied in Christianity and conservatism.

273. *American Political Theory.* I, II. 3 hr. Major political ideas and their influence upon American society and government from the seventeenth century to the present.

275. *Foundations of Jurisprudence.* II. 3 hr. Inquiry into: (a) nature, end, and sanctions of law; its sources, forms, and modes of growth, as evidenced in typical legal systems; general juristic concepts of rights, duties, and liabilities as well as persons, acts, and things; (b) main schools of jurisprudence—analytical, historical, philosophical, sociological, and that of legal realism; (c) economic interpretation of law and its relation to property and interest; (d) problem of legal rule versus discretion; (e) meaning of obligation, with special reference to contract; (f) stages in the development of legal institutions, forms and procedures (as exemplified in trials); (g) significant theories about law including the Marxian "aberration"; and (h) status of law in today's world.

279. *Analysis of Political Behavior.* II. 3 hr. Examines political behavior in terms of recent behavioral theories emanating from a variety of disciplines.

299. *Special Topics.* I, II. 1-3 hr.

300. *Introduction to Political Science Methodology.* I. 3 hr. Various research methods and techniques used in public analysis. Areas covered include: the logic of inquiry, research design, measurement techniques, survey and unobtrusive research, and data analysis.

310. *Intergovernmental Relations.* I. 3 hr. Analyzes the development of traditional American Federalism and its evolution into modern "intergovernmental relations." The inquiry extends to the theory and practice of the "new federalism," including its statutes, regulations, procedures, and institutions.

335. *Policy Analysis.* II. 3 hr. PR: Pol. S. 135 or equiv. Overview of the field of public policy studies; the issues and problems involved in studying policymaking; and assessment of policy analysis as a mode of thinking and inquiry.

336. *Politics of Agenda Setting.* II. 3 hr. Examines the confluence of social, economic, and political influences on the development of public problems and their placement on the policy agenda. *(Course will not be offered in 1983-84.)*

345. *Public Administration and Policy Development.* II. 3 hr. PR: Pol. S. 140 or consent. Decision-making and policy development in the administrative process by the case method.

350. *Proseminar in Comparative Politics*. I. 3 hr. PR: Graduate standing or consent.

351. *Politics of Planned Development*. I. 3 hr. Political aspects of social, economic, and technological change, with special reference to the politics of development planning and administration.

355. *Comparative Public Policy*. I, II. 3 hr. Comparison of public policy outputs in several western European countries and Japan with emphasis on the analysis of variables that account for variations in distributive, regulative, and extractive policies.

360. *Proseminar in International Relations*. I, II. 3 hr. PR: Graduate standing or consent.

370. *Proseminar in Political Theory*. I, II. 3 hr. PR: Graduate standing or consent.

Psychology

Faculty

Kathleen A. McCluskey, Ph.D. (U. Kans.), *Interim Chairperson and Associate Professor.*
Ellen S. Berler, Ph.D. (SUNY—Binghamton), *Assistant Professor; Assistant Chairperson.*
Kathleen K. Bissonnette, Ph.D. (WVU), *Adjunct Assistant Professor.*
Gordon Bourland, Ph.D. (U. Tex.—Arlington), *Adjunct Assistant Professor.*
Edward C. Caldwell, Ph.D. (Syracuse U.), *Associate Professor.*
Edward J. Callahan, Ph.D. (U. Vt.), *Associate Professor.*
James Capage, Ph.D. (Ohio U.), *Adjunct Associate Professor.*
James F. Carruth, Ph.D. (U. Ill.), *Professor.*
Philip N. Chase, Ph.D. (U. Mass.), *Assistant Professor.*
Stanley H. Cohen, Ph.D. (Mich. St. U.), *Associate Professor.*
Frank L. Collins, Jr. Ph.D. (Auburn U.), *Assistant Professor.*
Philip E. Comer, Ph.D. (WVU), *Professor.*
John D. Cone, Ph.D. (U. Wash.), *Professor.*
Quin F. Curtis, Ph.D. (U. Mich.), *Professor Emeritus.*
Lynnda M. Dahlquist, Ph.D. (Purdue U.), *Adjunct Assistant Professor.*
Nancy Datan, Ph.D. (U. Chicago), *Professor.*
Stephen F. Dryer, Ph.D. (U. N. Dak.), *Adjunct Assistant Professor.*
Barry A. Edelstein, Ph.D. (Memphis St. U.), *Associate Professor.*
Barbara J. Fehr, Ph.D. (U. Del.), *Adjunct Assistant Professor.*
Sharon Foster, Ph.D. (SUNY—Stony Brook), *Assistant Professor.*
William J. Fremouw, Ph.D. (U. Mass.), *Associate Professor.*
Irving J. Goodman, Ph.D. (U. Rochester), *Associate Professor.*
Samuel W. Goots, Ph.D. (WVU), *Adjunct Assistant Professor.*
Robert P. Hawkins, Ph.D. (U. Pitt), *Professor.*
Debra B. Hull, Ph.D. (Kent St. U.), *Adjunct Assistant Professor.*
Daniel E. Hursh, Ph.D. (U. Kans.), *Adjunct Associate Professor.*
Barbara D. Ingersoll, Ph.D. (Penn St. U.), *Adjunct Associate Professor.*
Jon E. Krapfl, Ph.D. (U. Mo.), *Professor.*
A. Darnell Lattal, Ph.D. (Penn St. U.), *Adjunct Assistant Professor.*
Kennon A. Lattal, Ph.D. (U. Ala.), *Professor.*
John C. Linton, Ph.D. (Kent St. U.), *Adjunct Associate Professor.*
Steven C. Luce, Ph.D. (U. Kans.), *Adjunct Assistant Professor.*
Robert W. Miller, Ph.D. (Ohio St. U.), *Professor.*
Lucille Nahemow, Ph.D. (Columbia U.), *Associate Professor.*
Russell J. Ohta, (U. S. Cal.), *Assistant Professor.*
Joseph V. Panepinto, Ph.D. (WVU), *Adjunct Professor.*
Ruth A. Panepinto, Ph.D. (WVU), *Adjunct Assistant Professor.*
B. Kent Parker, Ph.D. (U. Utah), *Associate Professor.*
Linda J. Parrott, Ph.D. (W. Mich. U.), *Visiting Assistant Professor.*
Robert E. Pawlicki, Ph.D. (York U.), *Adjunct Associate Professor.*

Eugene A. Quarrick, Ph.D. (Syracuse U.), *Professor.*
William K. Redmon, Ph.D. (W. Mich. U.), *Assistant Professor.*
Hayne W. Reese, Ph.D. (U. Iowa), *Centennial Professor.*
Richard J. Seime, Ph.D. (U. Minn.), *Adjunct Associate Professor.*
James N. Shafer, Ph.D. (Ohio St. U.), *Professor.*
Trevor F. Stokes, Ph.D. (U. Kans.), *Associate Professor.*
Richard T. Walls, Ph.D. (Penn St. U.), *Adjunct Professor.*

Program

Courses in psychology are designed for one or more of the following ends: (1) as part of a liberal arts education, principles, methods and theories are conveyed which are necessary for a better understanding of human and animal behavior; (2) basic preparation for students interested in graduate work leading to a career in basic or applied psychology; (3) preparation for a career as a bachelor's-level psychological assistant or technician, or as background for work in related social science fields.

The emphasis of preprofessional undergraduate training in psychology is placed on a broad liberal-arts education. Excessive specialization in psychology is discouraged for students who intend to pursue graduate training in psychology. Such students should seek a strong supporting background in mathematics and the natural and social sciences. A strong major, however, is recommended for students who do not intend to continue their education beyond the bachelor's degree.

Major in Psychology

Required Courses

Psych. 1, 2; Stat. 101; one course from each of the following groups of courses: Group I: Psych. 223, 224, 225, 232; Group II: Psych. 242, 243, 245; Group III: Psych. 262, 264, 274, 281, 282; Group IV: Psych. 251, 263, 279.

In addition, 12 hours of other upper-division psychology courses, excluding Psych. 190, 195, and 213.

Students who major in psychology should consider three options. Students who are primarily interested in the professional application of psychological principles to human problems should select additional courses from Groups III and IV. Students primarily interested in graduate training in psychology should consider taking Psych. 218 and additional courses which provide a broad theoretical coverage of modern psychology. Students primarily interested in psychology as it applies to their personal and social development are encouraged to take the following courses: Psych. 141, 151, 164, and 170.

All psychology majors should consider upper-division courses which provide an opportunity for them to apply basic principles of psychology. Particularly recommended for this purpose are Psych. 190, 195, and 213. Students must obtain the instructor's consent before enrolling in these courses. Application forms are available in the department office.

Electives in the following areas are taken frequently by psychology majors: biology, child development and family relations, computer science, mathematics, philosophy, political science, social work, sociology and anthropology, and statistics.

Honors Program

Honors sections of Psych. 1 are offered in the first and second semesters. These sections are open to all students in the University Honors Program. Psychology majors with outstanding academic records are encouraged to apply for admission to the Honors Program of the Department of Psychology.

Courses of Instruction in Psychology (Psych.)

Lower Division

1. *Introduction to Psychology.* I, II, S. 3 hr. Survey of general psychology.

2. *Research Methods in Psychology.* I, II, S. 3 hr. PR: Psych. 1. Research methods used in experimental, developmental, clinical, and community-social psychology are studied in both the laboratory and the natural environment.

Upper Division

(Psych. 1, or its equivalent or graduate standing, is a prerequisite to all upper-division courses. A total of 9 hours of psychology or graduate standing is a prerequisite to all 200-level courses.)

101. *Leadership and Human Relations.* I or II. 3 hr. Leadership training, motivation and morale, human relations, safety, industry, and society.

141. *Introduction to Human Development.* I, II, S. 3 hr. Survey of human development across the life span with an emphasis on change in physical, cognitive, and social-emotional processes. Applied problem solving by use of developmental information provides experience for service related professions such as social work, nursing, guidance, and counseling.

151. *Introduction to Social Psychology.* I, II, S. 3 hr. Social factors which determine human behavior. Relationships of class, race, culture, social structure, and other group phenomena to individual behavior.

164. *Personal and Social Adjustment.* I, II, S. 3 hr. Applications of material from personality, abnormal, clinical, and social psychology to the problems of achieving positive personality change.

170. *Sex Roles and Behavior.* I, II, S. 3 hr. Relates sex-typed behavior to physiological, social, and cultural processes. Current social concerns such as rape and abortion legislation, child care, and expanded career options for both sexes are examined from a psychological perspective.

190. *Teaching Practicum.* I, II, S. 1-3 hr. PR: Consent. *(No more than 12 hours of Psych. 190 may be counted toward the 42 hours of psychology to which majors are limited.)* Individually supervised experience in teaching, tutoring, and/or classroom management projects.

191. *Special Topics in Psychology.* I or II. 1-3 hr. Contemporary topics in psychology considered at an intermediate level for both psychology majors and majors in other areas.

195. *Field Experience in Psychology.* I, II, S. 1-15 hr. PR: Consent. *(No more than 18 hours of Psych. 195 may be counted toward the 128 hours required for the B.A. degree.)* Individually supervised experience in the applications of psychological principles and techniques. Psychology majors have the option of including or excluding hours earned in Psych. 195 in the 42 hours of psychology to which majors are limited. The off-campus semester is offered for 15 hours of credit in this course during the first and second semesters and for 12 hours of credit during the summer. Off-campus semester placements generally require completion of Psych. 274 before enrollment in this course.

196. *Seminar in Psychology.* I or II. 3 hr. PR: Junior or senior standing and consent. Selected topics of theoretical and applied significance in psychology.

213. *Directed Studies.* I, II, S. 1-3 hr. PR: Consent. *(No more than 12 hours may be applied to the 42 hours of psychology to which majors are limited.)* Individually supervised reading, research and/or classroom management projects.

218. *History and Systems of Psychology*. II. 3 hr. *(Recommended especially for students planning graduate study in psychology.)* A survey of psychology from its origins in philosophy, biology, and physics through the several major schools of psychological thought to modern perspectives of behaviors.

219. *Psychology As a Profession*. II. 1 hr. PR: Psychology major. *(Especially recommended for second-semester sophomores and juniors.)* Orientation to opportunities for experience, employment, and graduate and professional training in psychology. *(Offered only on Pass/Fail basis.)*

223. *Learning and Memory*. I. 3 hr. Theoretical and empirical issues in human and animal learning and memory with emphasis on mechanisms of memory, language, verbal behavior, and conceptual processes.

224. *Experimental Analysis of Behavior*. I, II. 3 hr. Laboratory and lectures survey research in operant conditioning and its implications for behavior theory and applications.

225. *Cognition and Perception*. I, II, S. 3 hr. Current issues and theory in human perception, thinking, language, and information processing.

232. *Physiological Psychology*. I. 3 hr. Introduction to the biological foundations and the physiological mechanisms of behavior.

242. *Prenatal and Infant Behavior*. I. 3 hr. Early influences upon behavior and development are investigated; topics include behavioral genetics, hazards of parental development, sensory and motor development, language development, and socioemotional development.

243. *Child and Adolescent Behavior*. II. 3 hr. Theory and research on the major psychological processes in childhood and adolescence are explored including maturation, personality, socialization, sensory, and cognitive development.

245. *Adulthood and Aging*. I or II. 3 hr. Cognitive and personality changes from maturity to old age. Psychological reactions to physiological change and to the establishment and dissolution of family units. Problems of intergenerational differences in adult behavior.

251. *Social Psychology*. II. 3 hr. Social factors which determine human behavior. Survey of the results of laboratory research in social psychology and its implications for social phenomena.

262. *Assessment of Behavior*. II. 3 hr. *(Completion of Stat. 101 or its equivalent is recommended.)* Theory and practice in development and use of psychological assessment procedures. Includes intelligence testing, behavioral assessment, and interviewing.

263. *Comparative Personality Theory*. I, II. 3 hr. Theoretical and empirical readings in a comparative survey of major perspectives in personality theory, including dynamic, cognitive, humanistic, and behavioral theories of personality.

264. *Psychology of Adjustment*. II. 3 hr. Dynamic principles of human personality adjustment.

274. *Survey of Behavior Modification*. I, II. 3 hr. Behavior therapy and modification including desensitization, covert sensitization, interpersonal skill training; aversion techniques and applied behavior analysis employing operant principles.

279. *Community Psychology*. I. 3 hr. Psychological principles applied to treatment and intervention strategies at the community level. Manpower development, organizational change, and systems analysis.

281. *Abnormal Psychology*. I, II. 3 hr. Major categories of behavioral disorders, e.g., neuroses, psychoses, and character disorders are considered in terms of etiology, treatment, outcome, and prevention.

282. *Exceptional Children.* I or II. 3 hr. Study of children who present psychological problems: (1) exceptional mental retardation or advancement; (2) organic disabilities having behavioral consequences, such as cerebal palsy or deafness; and (3) behavior disorders.

297. *Honors Investigation and Thesis.* I, II. 3 hr. *(May be repeated for credit; max. credit 6 hr.).* Supervised readings and investigation culminating in the honors thesis.

NOTE: Graduate standing or instructor's consent is a prerequisite to all 300-level Psychology courses.

301. *Personnel Psychology.* I or II. 3 hr. PR: Stat. 101, or equiv. Application of psychological principles and techniques to the problems of measurement and prediction of proficiency in industry and society.

304. *Leadership and Human Relations in Working Groups.* I or II. 1-3 hr. PR: Consent. Individual work related to either research or practice in the field of human relations training programs.

307. *Practicum in Industrial Interviewing.* I or II. 3 hr. PR: Psych. 201 or consent. Intensive review of principles of selection and validation. Practice interviews applying nondirective techniques in employment and other types of interviews.

311. *Research Design and Data Analysis 1.* I. 3 hr. Principles of experimental design in psychology including group and single subject methodologies. Topics include: (1) internal and external validity; (2) analysis of and mixed research designs; and (3) reversal and multiple baseline designs.

312. *Research Design and Data Analysis 2.* II. 3 hr. PR: Psych. 311 or consent. Inferential statistics, simple correlation and regression, multiple correlation and regression; partial correlation, analysis of covariance, analysis of variance of designs with unequal cell sizes.

313. *Directed Study.* I, II, S. 1-3 hr. per sem. PR: Consent. Directed reading and research in special areas. *(Undergraduates register for such projects under Psych. 213.)*

315. *Multivariate Analysis.* I or II. 3 hr. PR: Psych. 311, or equiv., and consent. Correlational methods in psychology with application to typical research problems. Includes simple matrix algebra, multiple correlation, discriminant analysis, and an introduction to factor analysis. *(Equiv. to Stat. 341.)*

316. *Correlational and Quasi-Experimental Designs.* I. (Alternate Years.) 3 hr. PR: Psych. 311 and 312 or equiv. Consideration of the methods, measurement, and analysis of nonexperimental research. Includes survey, correlational, and quasi-experimental designs; questionnaire and attitude scale construction; nonreactive measurement techniques; and data analysis.

318. *Ethical and Legal Issues.* II. 2 hr. The ethical standards for psychologists are applied to research and clinical problems. The legal regulations and contemporary issues in mental health are studied.

325. *Behavior Analysis 1.* I. 3 hr. PR: Graduate standing in psychology or consent. Conceptual, methodological, and empirical issues in the psychology of learning with emphasis on positive reinforcement and stimulus control; includes laboratory work with animals.

326. *Behavior Analysis 2.* II. 1 hr. PR: Psych. 325. Continuation of Psych. 325. Theory and research in aversive control of behavior, including negative reinforcement, punishment, and conditioned suppression.

327. *Behavior Analysis 3.* II. 2 hr. PR: Psych. 325, 326. Basic learning principles discovered with animals are extended to basic human research with emphasis upon: (1) ways the procedures and situations might be modified for human research, and (2) phenomena that are specific to humans.

340. *Advanced Developmental Issues and Methodology*. II. 3 hr. Developmental issues including historical perspectives, validity, theoretical systems, and growth models will be presented along with research methods and designs employed in life-span developmental psychology.

344. *Infant Behavior and Development*. I. (Alternate Years.) 3 hr. Examination of theories of infancy and evaluation of current research literature in the areas of cognitive, perceptual, language, and social development. Prenatal and neonatal development will also be emphasized. Related social issues will be discussed.

345. *Child Behavior and Development*. II. (Alternate Years.) 3 hr. Examination of the psychological literature on child behavior and developmental change in learning, cognition, language, social relations, and personality. Experimental research and theoretical explanations are emphasized, and implications for life-span development are discussed.

346. *Adulthood and Aging*. I. (Alternate Years.) 3 hr. Comparative theories of life-span development, current issues in research on adulthood and aging, including personality and socialization, age norms, biological change in adulthood and aging.

350. *Introduction to Behavioral Systems Analysis*. I. 3 hr. PR: Psych. 325 and 326 or consent. *(Specifically designed for graduate students in psychology.)* An introduction to behavioral and systems concepts, methods, and models as they apply to human service management, administration, and evaluation.

352. *Community Psychology*. I. (Alternate Years.) 3 hr. Psychological principles and research findings at the community level are applied to various types of intervention strategies. Manpower utilization, needs assessment, the community mental health movement, complex organization theory, and behavioral systems analysis are included.

360. *Behavior Pathology of Childhood*. I. 3 hr. Survey of types of adjustment problems of children, incidence, and research and theory about etiology.

364. *Child Behavior Modification*. II. 3 hr. Assessment, intervention, and evaluation strategies appropriate for childhood disorders and based on behavior modification principles derived from learning theory.

375. *Fundamentals of Gerontology*. II. 3 hr. PR: MDS 50 or consent. An advanced multidisciplinary examination of current research in biological, psychological, and sociological issues of human aging and the ways in which these impinge on the individual to create both problems and new opportunities. *(Also listed as Biol. 375 and Soc. & A. 375.)*

379. *Introduction to Clinical Psychology*. I. 2 hr. Basic interviewing skills and current problems in the practice of clinical psychology.

381. *Behavior Pathology*. II. 3 hr. PR: Psych. 281 or equiv. Advanced study of experimental research in psychopathology.

Public Administration (Pub. A.)

242. *American Administrative Systems*. S. 3 hr. Analysis of the nature and processes of American public administration (political, legal, economic, and social conditions), including the role of the bureaucracy in a democracy. *(Equiv. to Pol. S. 242.)*

Religious Studies

Faculty

Manfred O. Meitzen, Ph.D. (Harvard U.), *Chairperson and Professor.*
Alan W. Jenks, Th.D. (Harvard U.), *Associate Professor.*
Ottomar F. Cypris, Th.D. (Union Theol. Sem.), *Associate Professor Emeritus.*

Religious studies courses provide instruction in the field of our experience concerning God, the transcendent, and ultimate concern. Such studies include both our intellectual activity about this experience (theology) as well as our resultant deeds in worship and ritual, ethics, and history. Part of the curriculum is devoted to the study of the world's great scriptures. Another part deals with the history of religions. Another segment deals with contemporary religious thought. Another part probes into the interrelation of theology and culture. Throughout the religious studies program, attention is given to the relevance of the subject matter to the lives of the students at the time in which they are living. Courses in religious studies may be taken for University Core Curriculum credit, as well as elective credit, and are meant for the enrichment of the global, liberal-arts education of the student. Also, an interdepartmental major in religious studies may be undertaken. (See page 91.)

Courses of Instruction in Religious Studies (Relig.)

5. *An Introduction to Issues in Religious Studies.* I. 3 hr. *(For freshman students only.)* Leading issues involved in religious studies: transcendence, the God question, evil, redemption, community, eschatology, symbolism, ethics, examples of the relationship between religion and culture.

50. *Honors Course in Religious Studies.* I or II. 3 hr. *(Open to Honors students only.)* A basic, theological topic, which is suitable for study by an undergraduate honors class, will be selected for each semester.

100. *Introduction to the Synoptic Gospels.* I, II. 3 hr. Introduction to the origin and content of the Synoptic Gospels of the New Testament (Matthew, Mark, Luke). Discusses a number of basic theological issues and relates to the contemporary situation.

101. *A Study of Paul.* II. 3 hr. Introduction to the life and theology of Paul, involving a study of the letters of Paul and other pertinent early Christian literature. Discusses a number of basic theological issues and constantly relates Scripture teachings to the contemporary situation.

102. *Introduction to the Old Testament.* I. 3 hr. The story of Israel, her religious life, and great personalities up to about 800 B.C., based on a study of Genesis through II Kings. Basic theological and ethical issues are discussed in relation to the contemporary situation.

103. *Introduction to the Old Testament.* II. 3 hr. The story of Israel, her religious life, and great personalities from 800 B.C. to about 100 B.C., based on a study of the prophetic and wisdom literature of the Bible. Basic theological and ethical issues are discussed in relation to the contemporary situation.

104. *Origins of Judaism.* I or II. 3 hr. PR: Sophomore standing or above, or a previous religious studies course. Main beliefs and practices of the Jewish religion in its formative period, 500 B.C. to 500 A.D. Selections from late Old Testament writings, the Apocrypha and Pseudepigrapha, the Dead Sea Scrolls, and rabbinical literature.

105. *Introduction to the Johannine Literature.* I or II. 3 hr. Introduction to the origin and content of the Johannine Literature of the New Testament (Gospel, Epistles, and Revelation to John). Discusses a number of basic theological issues and relates them to the contemporary situation.

110. *Contemporary Theology 1.* I. 3 hr. Issues include: function of reason in Judaeo-Christian faith and relationship of reason and revelation to each other; Judaeo-Christian understanding of history; the question of Biblical literalism. *(Course will not be offered in 1983-84.)*

111. *Contemporary Theology 2.* II. 3 hr. Issues include: ecumenical movement within the church; the Spirit; recent transformations in ethical and social thinking (new morality); secular theology (new theology), theology of hope. *(Course will not be offered in 1983-84.)*

112. *Existential Theology.* I or II. 3 hr. An introduction into existentialism and its impact on theology. A dialog between existential problems (anxiety, loneliness, meaninglessness, guilt, death, lust, wrath, etc.) and the response of Judaeo-Christian faith.

120, 121. *History of Christian Thought.* I, II. 3 hr. per sem. A study of significant men and movements of thought among the Christians and the way in which these contributed to answering the perennial questions of religion from a Christian perspective. Relig. 120 covers the history of Christian thought to 1500; Relig. 121 from 1500 to the present. *(Courses will not be offered in 1983-84.)*

124. *Christian Thought in the Reformation Era.* I or II. 3 hr. PR: Sophomore standing or above, or a previous religious studies course. The significant people and movements in the four primary streams of sixteenth-century Christian thought in western Europe: Protestantism, radical Christianity, Roman Catholicism, and Anglicanism. *(Course will not be offered in 1983-84.)*

126. *Early Medieval Theology and Culture.* I or II. 3 hr. PR: Sophomore standing or above, or a previous religious studies course. The primary ways in which early medieval Christian thought responded to the cultural heritage of the West. The rise of the medieval syntheses of theology and culture. *(Course will not be offered in 1983-84.)*

128. *History of American Religion: 1607-1820.* I. 3 hr. The origins, growth, and influence of major religious ideas and movements which were significant in shaping the religious life of the American people in colonial and early federal periods. *(Course will not be offered in 1983-84.)*

129. *History of American Religion: 1820 to Date.* II. 3 hr. The origins, growth, and influence of major religious ideas and movements which have been significant in shaping the religious life of the American people since 1820. *(Course will not be offered in 1983-84.)*

130. *World Religions: Religions of India.* I. 3 hr. PR: Sophomore standing or above, or a previous religious studies course. Proto-Indian religion, Hinduism, beginnings of Buddhism, Jainism, Sikhism; historical and theological foundations; developments of thought; and contemporary expressions and encounters with the modern world.

131. *World Religions: China and Japan.* II. 3 hr. PR: Sophomore standing or above. Buddhism, Confucianism, Taoism, Shinto; historical and theological foundations, developments of thought; and contemporary expressions and encounters with the modern world.

132. *World Religions: Near Eastern.* I or II. 3 hr. PR: Sophomore standing or above, or a previous religious studies course. The ancient religions of Mesopotamia, Egypt, and Iran, and the origin and growth of Islam; historical and theological foundations; developments of thought; scriptures; and contemporary expressions and encounters with the modern world.

142. *Theological Perspectives in Modern Literature.* I or II. 3 hr. PR: Sophomore standing or above, or a previous religious studies course. Theological perspectives in selected modern writers including Beckett, Camus, Faulkner, Hesse, Hopkins, Wiesel, Eliot, and Auden. Theological insights into nihilism, evil, redemption, and meaning, as well as psychological analyses of religion, will be examined in these authors. Team-taught. *(Course will not be offered in 1983-84.)*

150. *Bibilical Ethics and Contemporary Issues.* I or II. 3 hr. Basic topics treated: principal types of ethics, sin, guilt, law, grace, the state, non-biblical ethics, etc. Ethical issues of the post-modern world: bioethics, euthanasia, environmental ethics, sex, etc.

290. *Seminar: Selected Topic.* I or II. 3 hr. PR: A previous religious studies course or consent.

Social Science (S. Sci.)

1, 2. *Introductory General Course.* I, II. 3 hr. per sem. A course designed to integrate the content and methods of the social science disciplines. Focuses on the technological, economic, social, and political dimensions of society. The First Semester uses a cross-cultural approach; the Second Semester emphasizes American society.

Sociology and Anthropology

Faculty

Ann L. Paterson, Ph.D. (Mich. St. U.), *Chairperson and Associate Professor of Sociology.*
Ronald C. Althouse, Ph.D. (U. Minn.), *Associate Professor of Sociology.*
Richard G. Ames, Ph.D. (U. N.C.), *Adjunct Associate Professor of Sociology.*
Richard A. Ball, Ph.D. (Ohio St. U.), *Professor of Sociology.*
Robert D. Foss, Ph.D. (U. Nev.), *Associate Professor of Sociology.*
Harold A. Gibbard, Ph.D. (U. Mich.), *Professor Emeritus.*
David S. Hall, Ph.D. (U. Ky.), *Associate Professor of Sociology.*
Rusi Hilloowala, Ph.D. (U. Ala.), *Adjunct Associate Professor of Anthropology.*
Harold N. Kerr, Ph.D. (Ohio St. U.), *Professor Emeritus.*
Jiri T. Kolaja, Ph.D. (Cornell U.), *Professor of Sociology.*
Arnold J. Levine, Ph.D. (Columbia U.), *Professor of Sociology.*
John D. Photiadis, Ph.D. (Cornell U.), *Professor of Sociology.*
Aaron M. Podolefsky, Ph.D. (SUNY—Stony Brook), *Assistant Professor of Anthropology.*
Patricia C. Rice, M.A. (Ohio St. U.), *Assistant Professor of Anthropology.*
Dorothy Rosenberg, Ph.D. (U. Pitt), *Lecturer in Sociology.*
John F. Schnabel, Ph.D. (U. N. Dame), *Associate Professor of Sociology.*
Joseph J. Simoni, Ph. D. (U. N. Dame), *Associate Professor of Sociology.*
Leonard M. Sizer, Ph.D. (U. Iowa), *Professor Emeritus.*
Jerold M. Starr, Ph.D. (Brandeis U.), *Associate Professor of Sociology.*
William I. Torry, Ph.D. (Columbia U.), *Associate Professor of Anthropology.*
Roger B. Trent, Ph.D. (U. Wash.), *Associate Chairperson and Associate Professor of Sociology.*
Neil J. Weller, Ph.D. (U. Mich), *Assistant Professor of Sociology.*

Programs

Sociology and anthropology courses constitute an important part of a general liberal education. They foster an awareness of the structure of human societies and of the social processes which operate in all groups, organizations, and institutions. The student is exposed to the methods of inquiry that sociology and anthropology have in common as well as to special knowledge and insights of the two disciplines. Courses in the department also are intended to facilitate the application of sociological and anthropological principles to the wide range of contemporary social problems. Undergraduate training in the department is particularly relevant for students in psychology, political science, economics, social work, education, communication, and the humanities. Sociology and anthropology also constitute an important part of the undergraduate education for those pursuing careers in law, the health professions, or business, and for engineers and scientists concerned with environmental and ecological problems. Majors in sociology and

anthropology often find employment doing applied research with government agencies, assisting in community development and planning, or using knowledge of social organization and social process in a variety of settings within the United States or abroad. Majors are well equipped for graduate training in the social sciences in pursuit of academic or applied research careers.

Students have the option of concentrating in sociology or in anthropology, or in a combination of these two fields.

Majors in Sociology and Anthropology

Students in all concentrations are required to take the following courses:

1. Stat. 101 or equivalent, preferably taken in the sophomore year. (PR: Math. 3 or equiv.)
2. Soc. & A. 1, preferably taken in freshman or sophomore years.
3. Soc. & A. 5, preferably taken in freshman or sophomore years.
4. Soc. & A. 201, for the sociology concentration (taken in senior year); or Soc. & A. 255, for the anthropology concentration (taken in senior year); or Soc. & A. 201 and 255, for the combined sociology and anthropology concentration.
5. Soc. & A. 211.
6. Soc. & A. 256. (Stat. 101 and Soc. & A. 211 are prerequisites.)

In addition to the above, majors concentrating in *sociology* are required to take an additional 15 hours in upper-division sociology courses and a 3-hour course in cultural anthropology or archaeology.

Majors concentrating in *anthropology* are required to take Soc. & A. 152, 12 additional hours in upper-division anthropology (i.e., courses in the 150- and 250-series), and an additional 3-hour course in upper-division sociology.

Majors choosing the combined *sociology and anthropology* concentration are required to take Soc. & A. 152, 9 additional hours in upper-division sociology courses, and 6 additional hours in upper-division anthropology courses.

Courses of Instruction in Sociology and Anthropology (Soc. & A.)

Lower Division

1. *Introduction to Sociology*. I, II, S. 3 hr. Basic course intended to develop a perspective about the nature of social processes and the structure of society.

5. *Introduction to Anthropology*. I, II, S. 3 hr. Essentials of human evolution and culture history with a consideration of varieties of languages and cultures found among peoples of the world.

51. *World Cultures*. I or II. 3 hr. A case study approach to the comparative examination of peoples and cultures around the world. Cases chosen range from small-scale, face-to-face tribal communities to folk and modern societies.

Upper Division

102. *Social Problems*. I, II. 3 hr. Causes of social disorganization in modern society and social life. Emphasis on research findings derived from studies of contemporary American society.

121. *The Family*. I, II. 3 hr. Comparative approach to changing structure and functions of the family institution. The effect of economic, demographic, and cultural changes on male-female relationships, sex roles, marriage, and child care.

122. *The Community*. I. 3 hr. Social structure of small towns and rural communities. The community power structure and political participation as they relate to community planning.

123. *Death and Dying*. I. 3 hr. Sociological and anthropological perspectives on death and dying. Examines sociopsychological and structural factors supporting the beliefs and practices associated with the institution of death, both historically and in contemporary society.

125. *Illness and Health Care*. I. 3 hr. An overview of behavioral factors relating to occurrence of and responses to illness, with particular emphasis upon American medicine. Designed especially for students interested in health-related careers.

131. *Urban Society*. II. 3 hr. Ecological, demographic, and sociocultural patterns of cities and their hinterlands, including a study of racial and ethnic neighborhoods of the inner city and the process of suburbanization.

132. *Criminology*. I, II. 3 hr. Exploration of various theories of criminal behavior; emphasis on a critical study of the criminal justice system and efforts to reform the penal system.

133. *Juvenile Delinquency*. I, II. 3 hr. Nature, extent, and causal explanation of forms of juvenile deliquency. The nature of juvenile courts, the correctional system, and prevention programs. Emphasizes current issues.

135. *Race Relations*. I or II. 3 hr. Causes and consequences of prejudice and discriminatory practices involving minority group members. Emphasis is on blacks, but social and economic conditions of Indians and other racial and religious minorities are also discussed.

136. *Sociology of Religion*. I or II. 3 hr. Relationship of religion and society. Origin of religious institutions, structure, function, and role in change or stability of the social system.

138. *Ethnic Groups*. I or II. 3 hr. Study of the major ethnic groups in the U.S., their social histories and present importance to the nation. Family histories are explored. Includes study of Irish, Polish, Italian, Greek, Mexican, Oriental and Native Americans.

140. *Social Change in Appalachia*. I or II, S. 3 hr. Description of early Appalachian society as a prelude to the understanding of the economic, social, and cultural changes taking place today. The family, church, education, social class, and community structure. Programs of directed intervention, change, and development discussed.

145. *Soviet Society*. I or II. 3 hr. Social and cultural trends in contemporary Soviet Union. Population characteristics, ethnic and nationality diversity; the family, education, political institutions and social classes; agricultural, industrial, and scientific organization. Comparisons with United States society.

151. *Ethnology*. I or II. 3 hr. Descriptive study of peoples and cultures of the world, especially pre-industrial societies.

152. *Physical Anthropology*. I. 3 hr. Fossil evidence for human evolution, racial variation, and relationship between biology and behavior.

153. *Cultures of the South Pacific*. I or II. 3 hr. Peoples and cultures of the South Pacific (Polynesia, Melanesia, and Micronesia) are examined. Topics include environment, prehistory, colonization, as well as traditional social organization, food production, child rearing, politics, law, warfare, religion, and cargo cults.

156. *Traditional and Changing Africa*. I or II. 3 hr. A survey of traditional social institutions found in hunting/collecting, agricultural, and pastoral societies of sub-Saharan Africa. Labor migration, urbanization, agricultural cooperatives, and other consequences of colonial rule will be considered.

157. *The Art of Primitive Peoples*. I or II. 3 hr. The art of prehistoric peoples from the Upper Paleolithic to the Urban Phase and the art of contemporary technologically primitive peoples will be described and functionally analyzed within their individual cultural contexts.

158. *Introduction to Archaeology*. I or II. 3 hr. Prehistoric cultures of the world and methods used in reconstructing them.

160. *Sociology of Sex Roles*. II. 3 hr. Overview of social and cultural influences on sex (gender) roles. Focuses on contemporary social arrangements and ideologies which support expected sex role behavior. Includes historical and cross-cultural comparisons.

190. *Teaching Practicum*. I, II, S. 1-6 hr.

191. *Special Topics*. I, II, S. 1-3 hr. Course topics change. Students may enroll more than once.

195. *Field Experience*. I, II, S. 1-18 hr.

201. *Sociological Theory*. II. 3 hr. PR: 6 hr. Soc. & A. and senior standing or consent. Systematic analysis of major sociological theories viewed from the historical perspective and in terms of current research.

202. *Deviant Behavior*. II. 3 hr. PR: 6 hr. Soc. & A. or consent. Examination of the processes by which "deviance" is defined in society, and the methods of social control attempted. Provides a critical understanding of society from the perspective of those defined as "outsiders"—criminals, addicts, etc.

204. *Complex Organizations*. II. 3 hr. PR: 6 hr. Soc. & A. or consent. The structure and functioning of large-scale, bureaucratic organizations, including studies of industrial organizations, prisons, hospitals, government bureaus, and the military in contemporary society.

205. *Class, Status, and Power*. I or II. 3 hr. PR: 6 hr. Soc. & A. or consent. Analysis of various systems of social inequality. Emphasis on empirical studies describing social class system, distribution of status and power, and patterns of social mobility in America.

211. *Social Research Methods*. I, II. 3 hr. PR: Soc. & A. 1 or 5 or consent. Logic of social research, elements of research design, and problems of measurement, with emphasis on survey research methodology and data analysis.

222. *Community Development*. II. 3 hr. PR: Soc. & A. 122, 133, 140, or consent. Application of sociological knowledge of structure of communities for planning programs and services. Emphasis on techniques of organizing efforts for community change.

232. *Sociology of Education*. I. 3 hr. PR: Soc. & A. 1, or consent. Education as a social institution, cultural and class influences on education, social roles and career patterns in the school system, the school and problems of the community. *(Also listed as Ed. F. 300.)*

233. *Sociology of Work and Work Places*. I. 3 hr. PR: Soc. & A. 1 or consent. Explores the significance of work and work relations in contemporary society. Emphasis is given to the analysis of employment settings including industrial organizations.

240. *Social Change*. I or II. 3 hr. PR: 6 hr. Soc. & A. or consent. Sociological analysis of current major changes in our society, of the forces underlying them, and of tensions to which they give rise. Alternative future directions and rational manipulation and planning for social change.

255. *Anthropological Theory*. I. 3 hr. PR: 6 hr. Soc. & A. or consent. Theoretical landmarks in early and modern anthropology. Includes British functionalism, psychological anthropology, French structuralism, and twentieth-century evolutionism in the United States.

256. *Field Methods*. II. 3 hr. PR: Soc. & A. 211 and Stat. 101 or consent. The distinctive craft of data gathering in cultural anthropology. Development of skills in field methods and participant observation.

257. *Primate Behavior*. I or II. 3 hr. PR: 3 hr. of any behavioral science or consent. Primates as they exist in their natural habitats suggest clues to early human behavior and evolution of behavior. Case studies and comparative behavior from prosimians, monkeys, and apes to human hunters and gatherers. *(Also listed as Biol. 235.)*

260. *Society and Personality*. I or II. 3 hr. PR: 6 hr. Soc. & A. or consent. Interaction between society and the individual's behavior. Key concepts are social role and the social self. Focus on adult experiences and adult socialization.

261. *Criminal Justice in America*. I or II. 3 hr. PR: 6 hr. Soc. & A. or consent. Critical examination of law, police, courts, and corrections (adult and juvenile); conservative, reform, and radical evaluations. Emphasizes such current issues and innovations as civil liberties, victimless crimes, prison reform, professionalization, community-based corrections, and behavior modification.

262. *Youth and Social Change*. I or II. 3 hr. PR: 6 hr. Soc. & A. or consent. A structural-historical approach to the study of youth as both product and agent of social change. Emphasizes concepts of human development, life course transition, age stratification, birth cohort, lineage, historical period, and sociocultural generation.

290. *Special Topics*. I, II, S. 1-3 hr. PR: 6 hr. Soc. & A. or consent. Topics change so students may enroll more than once.

293. *Independent Study*. I, II, S. 1-3 hr. per sem. PR: 3.0 grade-point average and written departmental permission. Directed reading or research for students desiring work not available in regular course offerings.

311. *Survey Research Methods*. I. 3 hr. PR: Soc. & A. 211 and Stat. 101 or consent. Provides students with an overview of survey research including problem definition, research design, sampling, measurement, instrument construction, project management, ethical considerations, and report writing.

313. *Qualitative Methods*. I. 3 hr. Provides students with supervised field experiences in interviewing, participant observation, and other methods of qualitative data gathering, analysis, and presentation.

315. *Comparative Research Methods*. II. 3 hr. Examines the relationship between theory and research through critical comparison of the principal designs and methods used in the social sciences. Special attention to alternative strategies for studying social service institutions.

317. *Data Analysis*. II. 3 hr. PR: Soc. & A. 311 or equiv. Using social science survey data, this course integrates statistics, computer usage, and social science theory to examine alternative methods of analyzing social science data. Makes extensive use of SPSS software package.

322. *Contemporary Sociologial Theory*. I or II. 3 hr. PR: Soc. & A. 201 or consent. Review of recent trends and orientations in sociology. Theory construction, typologies, mathematical models, and the relationship between theory and research. Review of current literature.

372. *Sociology of Health 2*. II. 3 hr. PR: Soc. & A. 125 or consent. A seminar focusing upon current issues in medical sociology.

375. *Fundamentals of Gerontology.* II. 3 hr. PR: MDS 50 or consent. An advanced multidisciplinary examination of current research in biological, psychological, and sociological issues of human aging and the ways in which these impinge on the individual to create both problems and new opportunities. *(Also listed as Psych. 375 and Biol. 375.)*

Speech Communication

Faculty

James C. McCroskey, Ed.D. (Penn St. U.), *Chairperson and Professor.*
Leonard M. Davis, Ph.D. (Northwestern U.), *Professor.*
Barbara J. Fehr, Ph.D. (U. Del.), *Assistant Professor.*
Donald L. Fry, Ph.D. (Ohio St. U.), *Assistant Professor.*
Betty Snyder Hall, M.A. (WVU), *Assistant Professor.*
William G. Husson, Ph.D. (Rensselaer Poly. Inst.), *Assistant Professor.*
Enid Portnoy, M.A. (Northwestern U.), *Assistant Professor.*
Virginia P. Richmond, Ph.D. (U. Nebr.), *Associate Professor.*
Walter H. Rockenstein, Ph.D. (Northwestern U.), *Associate Professor.*
John Shibley, Ph.D. (Ohio St. U.), *Associate Professor.*
Timothy D. Stephen, Ph.D. (Bowl. Grn. St. U.), *Assistant Professor.*

Programs

The Department of Speech Communication offers a curriculum designed to meet the needs of liberal-arts and pre-professional students, as well as students oriented toward communication-related careers. The undergraduate curriculum focuses upon the application of theory and research in human communication to a variety of personal and social settings. Majors may elect to follow either a Communication Theory and Research program or an Applied Communication Studies program.

Major in Speech Communication

The minimum requirement for a major in speech communication is 36 semester hours of credit. A total of 42 hours in speech communication may be counted toward graduation.

Communication Theory and Research

This program is designed for students who desire a broad, liberal-arts emphasis or who plan to consider graduate study in Speech Communication or Human Communication. It enables students to acquire a background in the areas of interpersonal, nonverbal, instructional, organizational, and mass communication. A 3.0 grade-point average for the first 58 hours of course work is required for admission. Required courses are Spch. 11, 12, 13, 14, and 160. The remainder of the program is determined by the student in consultation with a departmental adviser.

Applied Communication Studies

This program is designed for students who plan careers in Organizational Communication. It combines the general degree program in Speech Communication with a sequence of courses outside the department which prepares students for communication-related careers in business, industry, labor, politics or government. A 2.25 grade-point average for the first 58 hours of course work is required for admission. Required courses are Spch. 11, 12, 13, 14, 109, 111, and 160; C.S. 1 or 5; 6 hours selected from Engl. 105, 108, and 208; Psych. 1 and 2; Manag. 105 or 205. Recommended electives in Speech Communication are Spch. 106, 107, 133, 180, 195, and 221. Also required are 18

hours selected from the 6 categories below, with at least one course to be selected from two or more categories and at least two courses in at least one category:

1. Computer Science: C.S. 1,* 2, 5,* 50.
2. Journalism Skills: Journ. 1, 18, 19, 50.
3. Management: Manag. 105,* 205,* 206, 210, 213, 216.
4. Marketing: Mrktg. 111, 115, 120, 205.
5. Organizational Behavior: Psych. 101, 151, 251; Soc. & A. 204, 233; Pol. S. 120, 130, 140, 200, 225.
6. Public Relations and Advertising: Journ. 111, 113, 114, 121, 122, 123.

*May not be counted among 18 required hours if counted in other requirements.

Advisement

Before or during the first semester of the sophomore year, students interested in pursuing either the Communication Theory and Research program of the Applied Communication Studies program should consult with a departmental adviser.

Courses of Instruction in Speech Communication (Spch.)

Lower Division

11. *Principles of Human Communication.* I, II, S. 1 hr. Introduction to the human communication process with emphasis on the principles, variables, and social contexts of communication.

12. *Human Communication in the Interpersonal Context.* I, II, S. 2 hr. PR or Conc.: Spch. 11. Introduction to interpersonal communication with emphasis upon application of one-to-one communication in a variety of social contexts.

13. *Human Communication in the Small Group.* I, II, S. 2 hr. PR or Conc.: Spch. 11. Introduction to small-group communication with emphasis upon application in a variety of social contexts.

14. *Human Communication in the Public Communication Context.* I, II, S. 2 hr. PR or Conc.: Spch. 11. Introduction to principles of communication in the one-to-many context.

21. *Human Communication in a Contemporary Society.* I, II, S. 3 hr. Introduction to principles of communication and decision making in significant issues in a free society. Emphasis on topics such as freedom of speech and press.

80. *Introduction to the Mass Media.* I, II. 3 hr. Critical examination of mass media with special emphasis on ways in which social, economic, and psychological factors influence the structure, functions, and efforts of the media.

Upper Division

105. *Special Topics in Human Communication.* I, II. 3 hr. (Repeatable to 6 hr. total.) PR: Spch. 11. Topics include communication and conflict resolution, role of communication in negotiation and bargaining, contemporary communication criticism, issues in communication fields, etc.

106. *Nonverbal Communication.* I, II. 3 hr. PR: Spch. 11. An examination of the effects of human nonverbal behavior on human communication. Emphasis on specific nonverbal behaviors including touch, time, environmental contexts, physical appearance cues, and social communication cues.

107. *Human Communication and Rational Decision.* I. 3 hr. Argumentation, small group, persuasion, and systems theories application to the process and outcome of rational decision making in communication. Some emphasis on critical-rational response to manipulative communication.

108. *Nonviolence in Communication Behavior.* I. 3 hr. Nonviolent resistance as communication behavior. Emphasis on major proponents of and upon learning ways to apply nonviolence in communication behavior.

109. *Human Communication in Organizations and Institutions.* I, II. 3 hr. PR: Spch. 11. Communication processes and problems in business and nonbusiness organizations and institutions with attention to practical application.

111. *Human Communication and Social Change.* I, II. 3 hr. Communication in the societal setting with emphasis on communication of innovations, diffusion of information, and adoption of change.

131. *Human Communication and Language Behavior.* I, II. 3 hr. Introduction to the production and use of language with emphasis on linguistic, psychological, sociological, and developmental perspectives on language in human communication.

133. *Interpersonal Communication.* I, II. 3 hr. PR: Spch. 11. Survey of theoretical and research literature in interpersonal communication. Emphasis on interaction, interpersonal understanding, personal relationships, and self understanding as outcomes in interpersonal communication.

160. *Communication Research Methods.* I, II. 3 hr. PR: Spch. 11, and 12 hr. speech communication, or consent. Research methods in human communication and related professional areas with emphasis on understanding and evaluating research procedures. Special focus on practical applications.

161. *Directed Studies in Human Communication.* I, II. 3 hr. (Repeatable to 6 hr. total.) Independent study and research in special areas of human communication.

180. *Effects of Mediated Communication.* I, II. 3 hr. PR: Spch. 11. Messages and characteristics of mass media with emphasis on effects of mass communication on society.

187. *Appreciation of the Motion Picture.* I, II. 3 hr. Evaluation of motion picture and television film as forms of mediated communication and as art forms involving communication and aesthetic principles. Emphasis on the feature-length theatrical fiction film.

190. *Teaching Practicum.* I, II. 1-3 hr. PR: Consent. Individually supervised experiences in assisting with teaching, tutoring, and/or classroom management projects.

191. *Special Topics in Speech Communication.* I, II, S. 1-3 hr. (Repeatable to 6 hr. total.) PR: Consent.

195. *Field Experiences in Human Communication.* I, II, S. 1-3 hr. (Repeatable to 12 hr. total.) PR: Consent.

201. *Principles of Communication Education.* I, II, S. 3 hr. PR: 15 hr. speech communication. Literature, principles, and current practices of communication education in public schools with directed application. Intended for teachers in communication and language arts.

206. *Advanced Study in Nonverbal Communication.* I, II. 3 hr. PR: Spch. 106. Functions of nonverbal communication including status, power, immediacy, relationship development, regulation, turn-taking, leakage and deception, intuition, person perception, and emotional expressions.

221. *Persuasion.* I, II. 3 hr. PR: Spch. 11. Theory and research in persuasion, emphasizing a critical understanding and working knowledge of the effects of social communication on attitudes, beliefs, and behavior.

230. *Survey of Rhetorical-Communication Theory.* I, II. 3 hr. PR: Spch. 11. A survey of theory in the rhetorical communication context with emphasis upon periods preceding the twentieth century.

231. *Communication and Symbol Analysis.* I, II. 3 hr. PR: Spch. 131. Advanced study of language in communication. Specific attention to conversational analysis.

275. *Communication Problems of Children.* I, II, S. 3 hr. PR: Spch. 11. *(Primarily for elementary and secondary school teachers and language arts supervisors.)* Normal maturational development of listening and speaking skills, their relationships to language acquisition, and influence upon achievement.

281. *Media in Communication and Education.* I, II, S. 3 hr. Use of the media in educational and other communication environments with emphasis on communication processes and principles relevant to television and film.

Statistics

Faculty

Donald F. Butcher, Ph.D. (Iowa St. U.), *Chairperson and Professor.*
Anthony A. Billings, M.S. (WVU), *Lecturer.*
Daniel M. Chilko, M.S. (Rutgers U.), *Associate Professor.*
Shirley M. Dowdy, Ph.D. (U. N. Dame), *Associate Professor.*
Erdogan Gunel, Ph.D. (SUNY—Buffalo), *Associate Professor.*
Judith C. Hall, M.S. (Harvard U.), *Assistant Professor.*
E. James Harner, Jr., Ph.D. (Cornell U.), *Professor.*
Gerald R. Hobbs, Jr., Ph.D. (Kans. St. U.), *Associate Professor.*
William V. Thayne, Ph.D. (U. Ill.), *Associate Professor.*
Edwin C. Townsend, Ph.D. (Cornell U.), *Associate Professor.*
Stanley Wearden, Ph.D. (Cornell U.), *Professor.*

Admission to Pre-Statistics

General requirements for admission to the pre-Statistics program of study are that all prospective students must qualify for admission to WVU and to the College of Arts and Sciences and present secondary-school credit for 2 units of algebra, 1 unit of geometry, and ½ unit of trigonometry or advanced mathematics or 1 unit of chemistry or physics.

Additional Admission Requirements: Applicants must take the Standard ACT test and automatic admission to pre-Statistics will be based on the following:

West Virginia Residents: A high school grade-point average of at least 3.0 or a Standard ACT Mathematics score of at least 24.

Out-of-State Residents: A high school grade-point average of at least 3.3 or a Standard ACT Mathematics score of at least 26. Applicants not satisfying these admission requirements may gain admission to pre-Statistics as transfer students described below.

Transfer Students: Students wishing to transfer into pre-Statistics must satisfy WVU admission requirements, Arts and Sciences admission requirements, and as a minimum: (1) Have a grade-point average of at least 3.0 for all college-level work attempted, and (2) Have earned at least a C in Math. 15 and 16 and have at least a 2.5 grade-point average on all computer science, mathematics, and statistics course work attempted. The number of transfer students accepted into the department will be governed by the enrollment capacities of the degree programs. First admission priority will be granted to those students currently matriculated at WVU; second priority to students enrolled in statistics curricula at external colleges and universities; third priority to students enrolled in other degree programs at external colleges and universities. Within the last two priorities, preferential admission will be in the following order: West Virginia residents, U.S. citizens or permanent residents, and foreign students.

Admission to Statistics Degree Program

Statistics majors need at least a 2.5 grade-point average in all computer science, mathematics, and statistics courses attempted during the first two years of study to be admitted to the Bachelor of Science degree program in statistics. At a minimum this should include C.S. 1 and 2; Math. 15 and 16; and Stat. 201 and 212. Students not meeting these minimum requirements, but who display special aptitude for statistics studies, may request admission to the department on a provisional basis. Petitions should be addressed to the Statistics Academic Standards Committee and delivered to the department.

Degree Program

The Department of Statistics and Computer Science offers a degree program leading to a Bachelor of Science in Statistics. The degree program is designed to qualify students for professional positions in industry, research, government service, or graduate study in statistics or one of the quantitative fields of science.

The field of statistics presents methods of making decisions on the basis of probability. The baccalaureate program in statistics is intended to train a student to combine the scientific method with mathematics and inductive reasoning in order to serve on a research team as a member who can design experiments, analyze the results, and draw inference from them.

Students interested in a career in actuarial science should complete Stat. 261 and 262 during their junior years and Stat. 361 and 362 during their senior years.

Degree Program Requirements

Statistics majors must complete at least 60 hours of upper-division course work with at least 35 of these upper-division hours in statistics, computer science, and mathematics. At least 26 of these 35 hours must be in statistics. A student must have at least a C in all courses counted towards meeting the 35 upper-division hours in statistics, computer science, and mathematics.

Required Courses

Math. 15, 16, 17, 241; C.S. 1, 2; Stat. 101, 196, 197, 212, 213, 261, 262; three of the following: Stat. 221, 231, 251, 291, 341, 351, 371, 381; 6 additional hours of upper-division course work in mathematics, statistics, and/or computer science, and at least 60 hours of upper-division course work.

No more than 6 hours of 190-199 course work may be used in fulfilling the 35-hour, upper-division requirement in statistics, computer science, and mathematics; no more than 10 hours of 190-199 course work in any field may be used in fulfilling the 60-hour, upper-division requirement.

Recommended Electives

Any course listed above and Stat. 190, 195, 361, 362; C.S. 50, 51, 120, 220, 221, 230, 240, 260, 270; Math. 113, 163, 213, 251, 252, 255; E.E. 201; I.E. 250.

Courses of Instruction in Statistics (Stat.)

Upper Division

101. *Elementary Statistical Inference.* I, II. 3 hr. PR: Math. 3. Basic concepts of descriptive and inferential statistics; descriptive measures, random variables, sampling distributions, estimation, tests of hypotheses, chi-square tests, regression and correlation. *(Equiv. to Econ. 125.)*

190. *Teaching Practicum.* I, II, S. 1-4 hr. (May be repeated for a maximum of 6 hr.) PR: Stat. 212, 261. Practical classroom experience for undergraduate teaching assistants. Tasks assigned are those designed to provide experience with course design, implementation, evaluation, and revision of classroom work.

195. *Field Experience.* I, II, S. 1-18 hr. PR: Stat. 262 or equiv. *(Total credit applicable to any Arts and Sciences degrees may not exceed the maximum of 18 hours.)* Course for those who wish to work with faculty and field supervisors to design field experiences with planned learning objectives and credit goals.

196. *Statistics Seminar.* II. 1 hr. PR: Student must be a Statistics major. Satisfactory completion of the course requires that the student present a 20- to 50-minute talk on a selected topic and attend all scheduled meetings.

197. *Statistics Practicum.* I. 1 hr. PR: Stat. 201 and C.S. 1; open to Statistics majors only. Analysis of actual experiments using a computer under supervision of a faculty member.

201. *Introduction to Probability and Statistics.* I, II. 3 hr. PR: Math. 15. Probability, random variables, discrete and continuous probability distributions. Expected value, moment generating function, functions of random variables. Confidence intervals, tests of hypotheses, chi-square tests. Linear regress and correlation.

212. *Intermediate Statistical Methods.* I, II. 3 hr. PR: Stat. 101 or 201 or equiv. Extension of basic concepts of statistical inference: estimation and hypothesis testing for two populations, multiple regression and correlation, curvilinear regression, nonparametric tests, analysis of variance and covariance.

213. *Introductory Design and Analysis.* II. 3 hr. PR: Stat. 212. Introduction to the linear model, the complete and fractional factorial experiment, and the completely random, randomized complete block, Latin square, and split-plot experimental designs.

221. *Statistical Analysis System (SAS).* II. 3 hr. PR: Stat. 101 or 201 or equiv., and C.S. 1 or equiv. Introduction to the use of the Statistical Analysis System (SAS), a statistical computer program. Students will perform statistical data analysis, data file modifications, and statistical report writing.

231. *Sampling Methods.* I. 3 hr. PR: Stat. 101 or 201 or equiv. Methods of sampling from finite populations, choice of sampling unit and sample survey design. Estimation of confidence limits and optimum sample size. Single and multistage sampling procedures.

251. *Data Analysis.* II. (Alternate Years.) 3 hr. PR: Stat. 213. Computer analyses of simulated or real unbalanced data using a matrix approach to linear models. The techniques will include least squares analysis of variance and covariance, multiple, and polynomial regression, and multiple discrimination. *(Course will not be offered in 1983-84.)*

261. *Statistics and Probability 1.* I. 3 hr. PR: Math. 16. Events, random variables, discrete and continuous probability distributions. Expected value, moment generating functions, special probability distributions. Random sampling and distributions of certain functions of random variables. The Central Limit Theorem.

262. *Statistics and Probability 2.* II. 3 hr. PR: Stat. 261. Introduction to statistical inference. Properties of estimators and techniques of estimation. Hypotheses testing including the Neyman-Pearson Lemma and likelihood ratio tests. Regression and correlation including least squares. Selected topics.

264. *Fundamentals of Statistical Theory*. II. 3 hr. PR: Math. 16 or equiv., and Stat. 101 or 201 or equiv. Random variables and their probability distributions. Properties of estimators and methods of estimation. Principles of hypotheses testing. *(Course will not be offered in 1983-84.)*

291. *Special Topics*. I, II, S. 1-6 hr. Advanced study of special topics in statistics.

300. *Statistical Package: Social Sciences*. I. 2 hr. PR: Stat. 311 or equiv. Introduction to the use of the Statistical Package for the Social Sciences (SPSS), a statistical computer program. *(Course will not be offered in 1983-84.)*

311. *Statistical Methods 1*. I, II. 3 hr. PR: Math. 3. Statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regression, correlation, transformations, F and Chi-square distributions, analysis of variance and multiple comparisons. *(Equiv. to Ed. P. 311 and Psych. 311.)*

312. *Statistical Methods 2*. I, II. 3 hr. PR: Stat. 212 or 311 or equiv. Completely random, randomized complete block, Latin square and split-plot experimental designs. Unplanned and planned multiple and orthogonal comparisons for qualitative and quantitative treatments and factorial arrangements. Multiple linear regression and covariance analysis. *(Equiv. to Ed. P. 312 and Psych. 312.)*

313. *Design of Experiments*. II. 3 hr. PR: Stat. 312 or equiv. Expected mean squares, power of tests and relative efficiency for various experimental designs. Fixed, random, and mixed models. Use of sub-sampling, covariance and confounding to increase power and efficiency.

341. *Applied Multivariate Analysis*. I. 3 hr. PR: Stat. 212 or 311 or equiv. Introduction to Euclidean geometry and matrix algebra; multiple and multivariate regression including multiple and canonical correlation; the k-sample problem including discriminant and canonical analysis; and structuring data by factor analysis, cluster analysis, and multidimensional scaling.

351. *Applied Regression Analysis*. I. 3 hr. PR: Stat. 312. Matrix approach to linear and multiple regression, selecting the "best" regression equation, model building, and the linear models approach to analysis of variance and analysis of covariance.

361. *Theory of Statistics 1*. I. 3 hr. PR: Math. 17. Probability and random variables, univariate and multivariate distributions, expectations, generating functions, marginal and conditional distributions, independence, correlation, functions of random variables including order statistics, limiting distributions, and stochastic convergence.

362. *Theory of Statistics 2*. II. 3 hr. PR: Stat. 361. Techniques of point and interval estimation, properties of estimates including bias, consistency, efficiency, and sufficiency; hypothesis testing including likelihood ratio tests and Neyman-Pearson Lemma; Bayesian procedures, analysis of variance and nonparametrics.

371. *Introduction to Exploratory Data Analysis*. I. (Alternate Years.) 3 hr. PR: An introductory statistics course. Basic ways in which observations given in counted and measured form are approached. Pictorial and arithmetic techniques of display and discovery. Methods employed are robust, graphical, and informal. Applications to social and natural sciences.

381. *Nonparametric Statistics*. II. 3 hr. PR: Stat. 311 or equiv. Distribution-free procedures of statistical inference. Location and scale tests for homogeneity with two or more samples (related to independent); tests against general alternatives.

College of Business and Economics

The College of Business and Economics prepares students to work in business firms and other complex organizations. Whether you intend to operate a small firm or expect to join a large corporation, your program in business and economics will help you develop managerial skills.

A well-rounded selection of liberal arts courses contributes to your personal development. Courses such as statistics and business English assist you with your upper-division course load and are also helpful in your career. Special fields of interest are accounting, economics, finance, management, and marketing. Flexibility with electives allows you to strengthen your program in special areas.

Teaching methods used in the College of Business and Economics include lectures, laboratories, cases, guest lecturers, field trips, and internships. Closed-circuit video, telelecture, and other modern teaching techniques supplement class work.

Admission

High-school students interested in professional careers in accounting, economics, finance, management, or marketing should seek admission in the Pre-Business and Economics Program in the College of Arts and Sciences. On-campus students and transfer students who matriculated at an institution of higher learning in or after August, 1980, may seek admission into the College of Business and Economics upon completion of 58 or more credit hours, attainment of a 2.0 or better grade-point average, and completion of each of the following with a grade of C or better: 6 hours of of Principles of Economics, 6 hours of Accounting Principles, and a passing grade in Statistics. Similar students who matriculate initially, in or after August, 1982, at any institution of higher learning, may seek admission into the College of Business and Economics upon completion of 58 or more credit hours, attainment of a 2.25 or better grade-point average, and completion of each of the following with a C grade or better: 6 hours of Principles of Economics, 6 hours of Accounting Principles, and 3 hours of Statistics.

High-school graduates interested in professional programs in business administration and economics must meet the minimum requirements for admission to WVU. Prospective students should file applications with the Dean of Admissions and Records and stipulate the "Pre-Business and Economics Programs."

Additional information concerning admission, registration, fees and expenses, and regulations is in Part 2 of the *Undergraduate Catalog*.

Accreditation

The College of Business and Economics is accredited not only through the approval of WVU by national and regional accrediting agencies, but also through full membership in the American Assembly of Collegiate Schools of Business. This association is the only accrediting agency in the field of professional education for business at the collegiate level.

Administrative Officers

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Work Taken at Other Institutions

Students who expect to obtain a degree from the College of Business and Economics and who wish to take work at other institutions must have their programs approved by the Dean of the College of Business and Economics before registering at another institution of higher learning. Ordinarily required courses must be taken at WVU.

Maximum and Minimum Load

A minimum of 12 hours in a semester is required for full-time status in the College of Business and Economics. The maximum load is 18 hours in the College. Exceptions to the minimum or maximum load require approval of the Academic Standards Committee of the College before registration. Students seeking to withdraw from individual courses must petition the Committee on Academic Standards whenever the remaining load falls below the required minimum even though all other conditions supporting the request for the individual course withdrawal may be in order.

Individual Class Withdrawal Policy

The College of Business and Economics does not permit individual class withdrawals in the required pre-business and economics freshman and sophomore courses while being taken by junior and senior majors under the jurisdiction of the College of Business and Economics. Critial courses vital to a variety of upper-division courses include: Mathematics 3 and 28, Computer Science 5, Accounting 51 and 52, and Economics 54, 55, and 125. If "extraordinary" circumstances prevail, the student may petition the Academic Standards Committee for an exception.

Bureau of Business Research

The Bureau of Business Research is the formal research division of the College of Business and Economics. Various projects and programs are conducted and administered by the bureau, many of which are funded through grant and contract relationships with other organizations, both private and governmental. Basically, the bureau serves three interrelated functions—research, information services, and publication.

One of its missions is to identify research needs and opportunities, with special concern for those related to the economic problems of the Appalachian region. Appropriately, much of the recent grant-supported activity has dealt with three areas of concern to West Virginia—the development of travel and tourism, health care problems, and energy. Along with valuable data on current needs, students are provided with opportunities for training in research methods. Direct access to the West Virginia Network for Educational Telecomputing (WVNET) on Chestnut Ridge Road in Morgantown is provided through a terminal housed within the bureau.

The bureau also serves as a reseach center through its reference library of books and periodicals on business and economics, and responds continually to requests for statistical and economic information. As a member of the Association for University Business and Economic Research, the bureau receives many of the publications of research organizations at other universities, thus maintaining an up-to-date file of current research in the fields of business and economics.

Two scholarly publications of the bureau are the quarterly *Journal of Small Business Management*, having an international circulation, and the annual *Bibliography of the Association for University Business and Economic Research*. In addition, the bureau carries out a publication program which includes faculty working papers in both business and economics, plus various other works.

Multiple Bachelor Degrees

Concurrent Bachelor's Degrees

Students seeking to earn two bachelor's degrees simultaneously or concurrently, if one of the two to be earned includes a Bachelor of Science in Business Administration or Economics, must meet all requirements leading to either undergraduate degree offered by the College of Business and Economics. The student must complete all University Core Curriculum requirements, all College of Business and Economics Core requirements, and must satisfy the course requirements of one of the College of Business and Economics curricula. (See "Requirements for Degrees.") Students seeking to earn a Bachelor of Science in Business Administration or Economics and another bachelor's degree simultaneously must earn at least 30 hours in addition to the minimum of 128 hours required by the college. (See "Second Bachelor's Degree" in Part 2 of the *Undergraduate Catalog*.) Students seeking a Bachelor of Science in Business Administration or Economics and another bachelor's degree simultaneously are required to earn at least 30 hours of credit while enrolled in the College of Business and Economics, and in residence.

Successive Bachelor's Degree

A student who has received a bachelor's degree from an approved college or university may be eligible to enter the program for a second bachelor's degree in business administration or economics. This program is designed for persons who have already received a bachelor's degree in another field, who desire to strengthen themselves for careers in business and industry, and for those students who may wish to eliminate deficiencies and enhance their opportunities for graduate study. The required Business and Economics core leading to a second bachelor's degree in Business Administration comprises 42 hours. The required Economics and Business core leading to a second bachelor's degree in Economics comprises 36 hours. A second degree candidate must complete *all* courses in the stipulated Business and Economics core and such other courses as the Dean may prescribe.

A student may complete a portion of the required Business and/or Economics core while earning the first undergraduate degree. However, candidates for the second bachelor's degree must complete a minimum of 30 semester hours of credit in courses in the College of Business and Economics while in residence in the college. Residency may be established only after the student documents receipt of the first bachelor's degree.

Requirements for Degrees

Bachelor's Degree

To qualify for either the Bachelor of Science in Business Administration or the Bachelor of Science in Economics, the student must have:

1. Earned 128 semester hours of credit with a 2.0 grade-point average (C) on all work attempted at WVU and state institutions under the jurisdiction of the West Virginia Board of Regents. In addition, all students are required to maintain at least a 2.0 average on all work attempted after admission to the College of Business and Economics (not merely WVU).

2. Earned 128 semester hours of credit in subjects other than in Math. 2. A maximum of 6 hours of credit in advanced Military Science (ROTC) or advanced Air Force Aerospace Studies (ROTC) will be allowed toward graduation and is counted as a non-Business and Economics elective.

3. Earned at least 30 hours of credit while enrolled in the College of Business and Economics, and in residence.

4. Satisfied the requirements of the WVU Core Curriculum.

5. While the preceding constitutes the general requirements of the bachelor degrees of the College of Business and Economics, course requirements, specific grade requirements, and related academic requirements must be satisfied in one of the several curricula of the College of Business and Economics which follow.

Undergraduate Curricula

The College of Business and Economics offers two degrees—Bachelor of Science in Business Administration and Bachelor of Science in Economics. Programs leading to these degrees are designed to enable students to obtain a balanced selection of courses in liberal arts, a broad base of study in business and economics, and concentrated work in major areas of interest.

Bachelor of Science in Business Administration

The requirements for the Bachelor of Science in Business Administration are formulated in four parts: (1) 56 hours outside business and economics; (2) 6 hours of unrestricted courses in or out of the College of Business and Economics; (3) 30 hours in the common body of knowledge in business and economics; and (4) 36 hours in an area of concentration (accounting, finance, business management, or marketing) and in electives in business and economics with a career emphasis.

Since students interested in careers in business matriculate in the College of Arts and Sciences during their freshman and sophomore years, and since they transfer and matriculate in the College of Business and Economics in their junior and senior years, several vital dates and curricula requirements are cited below:

(a) Relative to pass-fail courses and grading, University regulations limit full-time junior and senior students to one course per semester or one course per summer session in free electives, excluding University Core Requirements, and cannot exceed a total of 16 hours of credit. The College of Business and Economics permits pass-fail grading in business or economics careers only under these conditions: (1) Pass-fail grading will be permitted only in courses numbered 200 (Special Topics) other than in the student's major area, and (2) in "free" electives in business and economics and only where the student has met all requirements (including business and economics "elective" requirements) and only where the course is not necessary to fulfill the various program and 128 credit degree requirements.

(b) Students majoring in any of the several areas of business must average a 2.0 (C) or better from courses in their areas of concentration (excludes required or elective courses in other disciplines in business or economics).

(c) (1) On-campus students and transfer students who matriculated at an institution of higher learning in or after August, 1980, may seek admission into the College of Business and Economics upon completion of 58 or more credit hours, attainment of a 2.0 or better grade-point average, and completion of each of the following with a grade of C or better: 6 hours of Principles of Economics, 6 hours of Accounting Principles, and a passing grade in Statistics; (2) Similar students who matriculate initially in or after August, 1982, at any institution of higher learning, may seek admission into the College of Business and Economics upon completion of 58 or more credit

hours, attainment of a 2.25 or better grade-point average, and completion of each of the following with a C grade or better: 6 hours of Principles of Economics, 6 hours of Accounting Principles, and 3 hours of Statistics.

The foregoing are minimum requirements. All students meeting the specific requirements may not be guaranteed admission into the college. Limitations on entry may be necessary depending upon the adequacy and the availability of faculty, other resources, and space.

A formal application must be submitted to the college by students seeking admission and will be reviewed to determine eligibility and acceptability.

Non-Business and Non-Economics Core	*Hr.*	*Total*
Engl. 1 and 2—Composition and Rhetoric	6	
Core Group A Courses:		
Engl. 105—Business Communication	3	
Other Group A Electives	9	
Core Group B Courses:		
Psych. 1—Introduction to Psychology	3	
Soc. & A. 1—Introduction to Sociology	3	
Other Group B Electives (Non-economics)	6	
Core Group C Courses (Management and Marketing Majors):		
Math. 3 (or 14), 15, 16, 28, or 128*	6-8	
C.S. 5—Computer Applications for Business	4	
Other Group C Electives (other than Stat. 101)	3	
OR		
Core Group C Courses (Accounting and Finance Majors)**		
Math. 3 (or 14)	3	
Math. 28	3	
Math. 128 (or 15)	3	
C.S. 5—Computer Applications for Business	4	
Other Electives—Non-Business and Economics	13	
	56	56
Unrestricted Electives (in or out of the College of Business and Economics)	6	6

All majors in business administration must complete a uniform body of common knowledge in business and economics consisting of 30 credit hours.

Required College Core Courses	*Hr.*	
Acctg. 51 and 52—Principles	6	
Econ. 54 and 55—Principles	6	
Econ. 125—Elementary Business and Economics Statistics	3	
B. Law 111—Legal Environment of Business	3	
Fin. 111—Business Finance	3	
Manag. 105—Contemporary Management	3	
Mrktg. 111—Introduction to Marketing	3	
Manag. 225—Business Policy	3	
	30	30
Courses in Major Field (and electives)	36	36
GRAND TOTAL		128

*Select any two of the listed mathematics courses. If a student elects to take 8 hours from those listed, only C.S. 5 will be necessary (12 hours).

**Math. 128 will be required for all students majoring in Accounting or Finance (except for Finance majors selecting the Insurance and Risk-Management Option) whose first college matriculation (WVU or elsewhere) is in August, 1982, or later.

Accounting Majors

Advanced work in accounting provides both specialized knowledge in accounting and financial reporting and an integrated overview of the economic activities of a business entity. Advanced accounting courses prepare students for a variety of positions in accounting, business, and financial management, such as controllers, financial officers, certified public accountants, certified accountants, tax accountants, public administrative officers, and other executives.

	Hr.
Acctg. 111 and 112—Intermediate Accounting	6
Acctg. 115—Cost Accounting	3
Acctg. 210—Advanced Accounting	3
Acctg. 211—Accounting Systems, *or* Acctg. 217—Auditing Theory*	3
Acctg. 213—Income Tax Accounting	3
B. Law 200—The Law and the C.P.A., *or* B. Law 112—Commercial Law	3
Econ. 130—Money and Banking	3
Business and Economics Electives*	12
	36

*Within the 12 hours of business and economics electives, the Accounting major must complete a minimum of 3 hours in economics. The remaining 9 business and economics elective hours should be distributed in accounting, other business and/or economics courses in support of a career objective. Students comtemplating C.P.A., C.M.A., or C.I.A. examinations should take both Accounting 211 and 217.

Mathematics 128, Introduction to Calculus (Core C), will be required of Accounting majors whose first college matriculation (WVU or elsewhere) was in August, 1982, or later. Although the "new" requirement may not be applicable to you, serious accounting majors are encouraged to select Mathematics 128 as a Core C course or as another elective.

Accounting majors must earn a grade of C or better in Accounting 111 before proceeding to Accounting 112. Accounting majors who entered the College of Business and Economics in August, 1982, or later, must also earn a grade of C or better in Accounting 112 prior to graduation.

Accounting majors are urged to carefully sequence the accounting courses for maximum benefit. In particular, Accounting 111 and 115 are recommended in the first semester of the junior year followed by Accounting 112 and 213 in the second semester.

Career Paths in Accounting

Careers in accounting include industrial, public, and governmental accounting. While accounting and potential accounting majors are urged to consult with the faculty relative to the opportunities and the preparation desirable in the several career areas, recommendations or guidelines are listed below in assisting students in the selection of electives in accounting, other business areas, economics and outside courses which will prepare students better for the several career paths and professional examinations in accounting.

Industrial Accounting

The following courses are recommended for selection as electives for students preparing for careers in industrial accounting:

Business and Economics Electives:
- Acctg. 200—Special Topics.
- Acctg. 211—Accounting Systems
- Acctg. 214—Income Tax Accounting

Acctg. 216—Advanced Managerial Accounting
Acctg. 217—Auditing Theory
Fin. 112—Financial Management
Fin. 150—Investments
Fin. 250—Security Analysis and Portfolio Management
Manag. 111—Operations Management
Manag. 112—Quantitative Business Methods
Econ. 160—Labor Economics
Econ. 211—Intermediate Microeconomic Theory
Econ. 225—Applied Business and Economic Statistics
Econ. 245—Government and Business

Non-Business and Non-Economics Electives:
Stat. 231—Sampling Methods
Engl. 8—Intermediate Composition
Engl. 108—Advanced Composition
I.E. 20—Fundamentals of Industial Engineering
C.S. 2—Computer Language

Public Accounting

The following courses are recommended for selection as electives for students preparing for careers in public accounting:

Business and Economics Electives:
Acctg. 200—Special Topics
Acctg. 211—Accounting Systems
Acctg. 214—Income Tax Accounting
Acctg. 217—Auditing Theory
Acctg. 218—Auditing Practice
Fin. 115—General Insurance
Fin. 150—Investments
Fin. 250—Security Analysis
Manag. 111—Operations Management
Manag. 112—Quantitative Business Methods
Econ. 211—Intermediate Microeconomic Theory
Econ. 225—Applied Business and Economic Statistics
Econ. 245—Government and Business

Non-Business and Non-Economics Electives:
Engl. 8—Intermediate Composition
Engl. 108—Advanced Composition
C.S. 2—Computer Language Concepts
Stat. 231—Sampling Methods

Governmental Accounting

The following courses are recommended for selection as electives for students preparing for careers in governmental accounting:

Acctg. 200—Special Topics
Acctg. 211—Accounting Systems
Acctg. 214—Income Tax Accounting
Acctg. 216—Advanced Managerial Accounting
Acctg. 217—Auditing Theory
Fin. 150—Investments
Manag. 112—Quantitative Business Methods
Econ. 225—Applied Business and Economics Statistics
Econ. 241—Public Finance
Econ. 245—Government and Business

Non-Business and Non-Economics Electives:
Stat. 231—Sampling Methods
Engl. 8—Intermediate Composition
Engl. 108—Advanced Composition

Business Management Majors

Students interested in personnel management, industrial relations, operations management, and in administrative positions involving analysis and decision making should enroll in this curriculum.

A student majoring in business management must arrange a program around one of five options: administration and organizational behavior, personnel management, operations management, management science, or small business management.

Administration and Organizational Behavior Option

The option in administration and organizational behavior emphasizes a study of the supervisor-subordinate relationship as it operates in the environment of an organization. Students are helped to develop managerial skills in leadership, motivation, communications, decision making, and policy formulation. Simultaneously, students learn ways in which these skills can be employed in organizations with established goals, technology and structure.

Individuals desiring a career in administration can select course work which will prepare them in such areas as are listed below:

Industrial Relations—Typically positions in industrial relations are with labor-management relations, and involve such areas as collective bargaining, labor law, negotiating, and writing the union contract, handling grievances and arbitration, and dealing with absenteeism and drug problems.

General Management—This career path offers opportunities in lower or middle management positions which involve the administration of a major organizational activity of a business firm.

Organizational Development—Career opportunities typically deal with methods of organization improvement in such areas as the application of management by objectives, the tools and techniques of organizational change, and processes associated with integrating employee desires with organizational goals.

Planning—Career paths in this area include positions involving the development of plans for the acquisition and deployment of human, financial, and material resources available to the firm.

Administration and Organizational Behavior Program

	Hr.
Acctg. 116—Managerial Accounting	3
Manag. 112—Quantitative Business Methods	3
Manag. 201—Management Information Systems	3
Manag. 205—Individual and the Organization	3
Manag. 206—Organizational Theory and Analysis	3
Manag. 216—Personnel Management	3
Business and Economics Electives (6 hours must be in economics.)	18
	36

Business management majors following this option are urged to consult with faculty and follow the recommendations below in the selection of business, economics, and outside electives.

Recommended Business and Economics Electives:
- Manag. 200—Special Topics
- Manag. 213—Independent Study
- B. Law 200—Special Topics
- Acctg. 216—Advanced Managerial Accounting
- Econ. 262—Collective Bargaining

Recommended Outside Electives:
- Pol. S. 140—Introduction to Public Administration
- Psych. 101—Leadership and Human Relations
- Psych. 151—Introduction to Social Psychology
- Soc. & A. 233—Sociology of Work and Work Places
- Spch. 221—Persuasion

Students should take a minimum of the foregoing from either their unrestricted electives, Group A or B requirements, or from other free outside electives.

Personnel Management Option

Graduates with personnel training may be assigned to tasks dealing with employee programs and benefits, employee services, management training and education, manpower planning and development, recruiting, interviewing, selecting and orienting new employees, job evaluation and wage-salary administration.

Personnel Management Program

	Hr.
Manag. 111—Operations Management	3
Manag. 201—Business Information Systems	3
Manag. 205—Individual and the Organization	3
Manag. 206—Organizational Theory and Analysis	3
Manag. 216—Personnel Management	3
Manag. 217—Personnel and Compensation	3
B. Law 211—Personnel Relations and the Law	3
Econ. 160—Labor Economics	3
Econ. 262—Collective Bargaining	3
Business and Economics Electives	9
(Recommended Elective: Manag. 218—Focal Points in Management.)	—
Total	36

Recommended Outside Electives:

Business management majors electing the personnel management option are particularly urged to choose a minimum of the courses listed below from either their Group A or B requirements, unrestricted electives, or free outside electives (as appropriate):
- I.E. 222—Job Evaluation and Wage Incentives
- I.E. 280—Industrial Engineering Problems
- Psych. 101—Leadership and Human Relations
- Soc. & A. 233—Sociology of Work and Work Places
- Spch. 80—Introduction to the Mass Media
- Spch. 221—Persuasion

Operations Management Option

Students interested in quantitative techniques and their application to managerial decisions should enroll in this curriculum. The most likely career paths for students selecting operations management include staff positions in production or inventory planning and control and line position in production management.

Operations Management Program

	Hr.
Manag. 111—Operation Management	3
Manag. 112—Quantitative Business Methods	3
Manag. 201—Business Information Systems	3
Manag. 205—Individual and the Organization	3
Manag. 210—Business Decision Making Under Uncertainty	3
Manag. 220—Deterministic Decision Analysis	3
Acctg. 116—Managerial Accounting	3
Mrktg. 207—Business Logistics Management	3
Business and Economics Electives	9
(Within the 9 hours business or economics electives the operations management major must complete 6 hours in economics. The remaining 3 hours should be distributed in management, other business, and/or economics courses in support of career objectives.)	
I.E. 140—Motion and Time Study	3
I.E. 261—System Safety Engineering	3
Stat. 231—Sampling Methods	3
Total	42

A careful examination of the 128-hour degree requirement reveals that a 20-credit-hour block of "outside elective" courses may be used to support the required operations management option (20 hours: 3 hr. from non-identified Group C; 11 hr. from the free outside electives; and 6 hr. from unrestricted area).

Students selecting this option should seek advice in curriculum planning from the management faculty, particularly if possible, during their freshman or sophomore years. Advice and guidance in the selection of both inside and outside elective courses will be valuable in lending support to careers in operations and management.

Management Science Option

Students with strong backgrounds in mathematics and/or statistics and those who desire to pursue the application of quantitative techniques to managerial decisions in considerable depth should enroll in this curriculum. Students selecting the management science option are trained for staff positions in management science, operations research, systems analysis, organizational planning, and the industrial application of computer science, mathematics, and statistics.

Management Science Program

	Hr.
Manag. 111—Operations Management	3
Manag. 112—Quantitative Business Methods	3
Manag. 201—Business Information Systems	3
Manag. 205—Individual and the Organization	3
Manag. 210—Business Decision Making Under Uncertainty	3
Manag. 220—Deterministic Decision Analysis	3
Acctg. 116—Managerial Accounting	3
Econ. 225—Applied Business and Economics Statistics	3
Business and Economics Electives	12
(Within the 12 hours business or economics electives the management science major must complete 3 hours in economics. The remaining 8 hours should be distributed in management, other business, and/or economics courses in support of career objectives.)	
C.S. 60—Introduction to COBOL Programming	3
Total	39

A careful examination of the 128-hour degree requirement reveals that a 20-credit-hour block of "outside elective" courses may be used to support the required management science option (22 hours: 3 hr. from non-identified Group C; 13 hr. from the free outside electives; and 6 hr. from the unrestricted area).

Students interested in the management science program should consult with the management faculty as early as possible in their college careers, preferably at the freshman or sophomore stage. For your guidance, however, a list of the more vital outside support courses follows:

Recommended Outside Electives:

Electives should be selected from mathematics, computer science, statistics, and industrial engineering.

Small Business Program

The option in small business emphasizes a study of the entrepreneur and the myriad roles in which the enterpreneur must function. Concepts and skills are developed in this option for application to the unique problems and situations of the small businessman. Because of the many "hats" the entrepreneur must wear, individuals who will have an emphasis in small business will receive a "generalist" background and will be able to create and direct business organizations to produce and market new products or services.

	Hr.
B. Law 112—Commercial Law	3
Fin. 115—General Insurance	3
Acctg. 116—Managerial Accounting	3
Mrktg. 120—Promotion Management	3
Manag. 111—Operations Management	3
Manag. 120—Promotion Management	3
Manag. 160—Management of Small Business	3
Manag. 216—Personnel Management	3
Manag. 230—Entrepreneurship	3
Manag. 260—Practicum in Small Business	3
Business and Economics Electives	9
(Within the 9 hours business or economics electives, the small business major must complete 6 hours in economics.)	—
Total	36

Finance Majors

The finance curriculum prepares students for a variety of positions in financial and non-financial enterprises. Since the finance function permeates every organization, students are given an opportunity to select an area in finance with depth so they can pursue a career of their choice.

Five program options are as follows:

1. Commercial Bank and Financial Institutions Option.
2. Corporate Finance Option.
3. Insurance and Risk-Management Option.
4. Real Estate Option.
5. Security Markets and Investment Option.

Because of the emphasis on the use of analytical tools in finance courses, finance majors (except those selecting the Insurance and Risk Management Option) must earn a grade of C or better in Finance 111, Business Finance,

before attempting Finance 112, Financial Management. Written exceptions may be permitted by the instructor in Finance 112.

Mathematics 128, Introduction to Calculus (Core C), will be required of Finance majors (except those selecting the Insurance and Risk-Management Option) whose first college matriculation (WVU or elsewhere) is in August, 1982, or later. Although the "new" requirement may not be applicable to you because of the effective date, serious finance majors are encouraged to select Mathematics 128 as a Core C course or as an other elective.

The "revised" curriculum with various options is effective for all Finance majors who enter the College of Business and Economics (not just WVU) in or after August, 1982. While students enrolled as majors in the College prior to August, 1982, may follow the Finance curriculum listed in the *Undergraduate Catalog* of 1981-82 or earlier (as applicable), they may opt to the "revised" curriculum if it is feasible and desirable.

Commercial Bank and Financial Institutions Option

Students who wish to follow a career in commercial banking or in other financial institutions should enroll in this curriculum. This area of concentration places emphasis on the operations, financing, and management functions of depository institutions. Concepts and skills to apply to the unique problems encountered in commercial banks, savings and loan associations, and other types of financial services institutions are developed in this program. The career path includes management opportunities in commercial banking, bank regulatory agencies, savings and loan associations, governmental agencies, credit unions, and sales and consumer finance companies.

Commercial Bank and Institutions Program

	Hr.
Fin. 112—Financial Management	3
Fin. 150—Investments	3
Fin. 151—Financial Institutions	3
Fin. 200—Special Topic: Working Capital Management	3
Fin. 250—Security Analysis and Portfolio Management	3
Fin. 251—Commercial Bank Management	3
Fin. 252—Advanced Bank Management	3
Acctg. 116—Managerial Accounting	3
Econ. 130—Money and Banking	3
Business and Economics Directed Electives (9 hr. from list below)	9
Fin. 262—Real Estate Finance	3
Acctg. 111—Intermediate Accounting	3
B. Law 200—Special Topic: Law and Lending	3
Econ. 241—Public Finance	3
Econ. 245—Government and Business	3
Manag. 112—Quantitative Business Methods	3
Manag. 216—Personnel Management	3
Total	36

Corporate Finance Option

This career path is for those students interested in a career in the financial administration of business firms, non-profit organizations and government agencies. The option emphasizes analytical tools for financial decisions for the above organizations.

Corporate Finance Program

	Hr.
Fin. 112—Financial Management	3
Fin. 115—General Insurance	3
Fin. 150—Investments	3
Fin. 151—Financial Institutions	3
Fin. 200—Special Topic: Working Capital Management	3
Acctg. 116—Managerial Accounting	3
Econ. 130—Money and Banking	3
Business and Economics Directed Electives (9 hr. from list below)	9
Fin. 216—Risk Management	3
Fin. 251—Bank Management	3
Fin. 262—Real Estate Finance	3
Fin. 317—Capital Budgeting (Special Approval)	3
Acctg. 213—Income Tax Accounting	3
B. Law 200—Special Topic: Law and Lending	3
Econ. 211—Intermediate Microeconomic Theory	3
Econ. 212—Intermediate Macroeconomic Theory	3
Econ. 225—Applied Business and Economics Statistics	3
Econ. 245—Government and Business	3
Manag. 111—Operations Management	3
Manag. 210—Business Decision-Making Under Uncertainty	3
Business and Economics Free Electives	6
Total	36

Insurance and Risk-Management Option

This curriculum is designed for those students who are interested in the fields of insurance and risk management. Approximately two million people are employed in this industry nationally, and they are from every profession and business specialty. The best career opportunities are in underwriting, loss control, management, loss adjustment, data processing, accounting, sales and marketing.

Insurance and Risk-Management Program

	Hr.
Fin. 115—General Insurance	3
Fin. 120—Life Insurance	3
Fin. 216—Risk Management	3
Fin. 220—Social Insurance	3
Manag. 205—The Individual and the Organization	3
Business and Economics Directed Electives (15 hr. from list below)	15
Fin. 112—Financial Management	3
Fin. 150—Investments	3
Fin. 151—Financial Institutions	3
Fin. 161—Real Estate	3
Fin. 261—Real Estate Appraisal	3
Acctg. 111—Intermediate Accounting	3
Acctg. 112—Intermediate Accounting	3
Acctg. 116—Managerial Accounting	3
B. Law 112—Commercial Law	3
B. Law 211—Personnel Relations and the Law	3
Manag. 216—Personnel Relations	3
Mrktg. 114—Personal Selling	3
Mrktg. 120—Promotion Management	3
Mrktg. 203—Sales Management	3
Business and Economics Free Electives	6
Total	36

Real Estate Option

Opportunities for professionals in real estate have increased sharply and appear promising in the decade ahead. The real estate option is designed to prepare students for careers in any of the following areas of real estate: marketing, appraising, developing, investing and mortgage lending.

West Virginia Real Estate Licensing. Finance 161, Real Estate, and an appropriate Business Law course fulfill the educational requirement for those taking the Real Estate Salesperson's examination. In addition, those students who may seek a Real Estate Broker's License should take Fin. 261, Real Estate Appraisal, and Fin. 262, Real Estate Finance.

Real Estate Program

		Hr.
Fin. 112—Financial Management		3
Fin. 161—Real Estate		3
Fin. 261—Real Estate Appraisal		3
Fin. 262—Real Estate Finance		3
Fin. 263—Real Estate Investments		3
Acctg. 116—Managerial Accounting		3
Econ. 130—Money and Banking		3
Business and Economics Directed Electives (9 hr. from list below)		9
Fin. 115—General Insurance	3	
Fin. 151—Financial Institutions	3	
Fin. 216—Risk Management	3	
Acctg. 213—Income Tax Accounting	3	
B. Law 112—Commercial Law	3	
B. Law 200—Special Topic: Law and Lending	3	
Econ. 245—Government and Business	3	
Econ. 255—Regional Economics	3	
Econ. 257—Urban Economics	3	
Mrktg. 114—Personal Selling	3	
Geog. 210—Urban Geography	3	
Geog. 255—Urban Planning	3	
L. Arc. 5—Introduction to Landscape Architecture	3	
Business and Economics Free Electives		6
Total		36

Security Markets and Investment Option

Students interested in security sales, security analysis, and portfolio administration should select this option. This option prepares students for careers with brokerage houses, investment banking firms, trust departments of commercial banks, pension funds, foundations, endowment funds, mutual funds, and a number of other financial and nonfinancial institutions where security analysis and portfolio management are vital functions.

Security Markets and Investment Program

		Hr.
Fin. 112—Financial Management		3
Fin. 150—Investments		3
Fin. 151—Financial Institutions		3
Fin. 250—Security Analysis and Portfolio Management		3
Acctg. 116—Managerial Accounting		3
Acctg. 213—Income Tax Accounting		3
Econ. 130—Money and Banking		3
Business and Economics Directed Electives (Total of 9 hr. with a minimum of 3 hr. from each Group)		9
Group 1—Minimum of 3 hours:		
Acctg. 111—Intermediate Accounting	3	
Acctg. 112—Intermediate Accounting	3	
Acctg. 214—Income Tax Accounting	3	
Econ. 225—Applied Business & Economics Statistics	3	
Manag. 201—Business Information Systems	3	
Group 2—Minimum of 3 hours:		
Econ. 211—Intermediate Microeconomic Theory	3	
Econ. 212—Intermediate Macroeconomic Theory	3	
Econ. 241—Public Finance	3	
Econ. 245—Government and Business	3	
Group 3—Minimum of 3 hours:		
Fin. 216—Risk Management	3	
Fin. 251—Bank Management	3	
Fin. 263—Real Estate Management	3	
Mrktg. 114—Personal Selling	3	
Business and Economics Free Electives		6
Total		36

Marketing Majors

Marketing offers a wide variety of career opportunities in such fields as promotion management (advertising and sales); sales management; distribution (retail and wholesale management, purchasing, transportation management, and physical distribution); and marketing research.

The marketing curriculum is designed to give the students a broad working knowledge of the theory and practice of marketing as preparation for employment or further study.

Electives provide flexibility in the several phases of marketing adaptable to the students' special career interest in either small and local firms or the multinational corporate giants (see Career Paths below).

Students interested in pursuing careers in any of these areas should enroll in this program.

	Hr.
1. Required Marketing Core (select 4 of the 5 core courses)	12
Mrktg. 113—Marketing Research	
Mrktg. 114—Personal Selling	
Mrktg. 115—Distribution Channels	
Mrktg. 120—Promotion Management	
Mrktg. 130—Product and Price Policies	
2. Required of all Marketing Majors	3
Mrktg. 211—Marketing Management	
3. Marketing Electives	6
4. Business and/or Economics Electives*	15
	36

*Within the 15 credit hours of business and/or economics electives, the marketing major must complete 6 hours in economics. The remaining 9 hours should be distributed in marketing, other business and/or economics courses in support of career objectives.

Marketing Career Guidelines

While marketing majors are free to select any combination of marketing elective courses, economic electives, other business electives, and outside courses to meet program and degree requirements, students are urged to consult with faculty and consider the guidelines and recommendations enumerated below in the several possible career paths in marketing.

Distribution/Purchasing Career Path

Recommended Marketing Core (12 hours):

Mrktg. 113—Mrktg. Research	Mrktg. 115—Distrib. Channels
Mrktg. 114—Personal Selling	Mrktg. 130—Prod. and Price Pol.

Recommended Marketing Electives (6 hours):

Mrktg. 160—Retailing Manag.	Mrktg. 207—Bus. Logistics Manag.
Mrktg. 120—Promot. Manag.	Mrktg. 210—Industrial Mrktg.

Required of All Marketing Majors (3 hours):

Mrktg. 211—Marketing Manag.

Recommended Business Electives (9 hours):

Manag. 111—Operations Manag.	Acctg. 116—Managerial Acctg.
Manag. 112—Quant. Bus. Meth.	B. Law 112—Commercial Law
Manag. 205—Indiv. & Org.	Fin. 112—Fin. Manag.

Recommended Economics Electives (6 hours):

Econ. 245—Govt. and Bus.	Econ. 246—Transportation Econ.

Recommended Outside Electives:

C.S. 60—Intro. COBOL	Pol. S. 100—Intro. Pol. Anal.
Engl. 208—Sci./Tech. Writ.	Pol. S. 200—Quant. Pol. Anal.
Phil. 10—Intro. Symb. Logic	Spch. 107—Hum. Comm./Rat. Dec.
Phil. 106—Math. Logic	Stat. 231—Sampling Meth.
Psych. 101—Ldrshp & Hum. Rel.	Soc. & A. 204—Complex Org.
Psych. 151—Intro. Soc. Psych.	Soc. & A. 233—Soc. of Work

Sales Management Career Path

Recommended Marketing Core (12 hours):

Mrktg. 114—Personal Selling	Mrktg. 120—Promot. Manag.
Mrktg. 115—Dist. Channels	Mrktg. 130—Prod. and Price Pol.

Recommended Marketing Electives (6 hours):

Mrktg. 113—Mrktg. Research	Mrktg. 205—Cons. Behavior
Mrktg. 203—Sales Manag.	Mrktg. 210—Industrial Mrktg.

Required of All Marketing Majors (3 hours):

Mrktg. 211—Marketing Manag.

Recommended Business Electives (9 hours):

Acctg. 111—Intermed. Acctg.	Manag. 217—Pers. & Comp.
Acctg. 112—Intermed. Acctg.	Manag. 205—Ind. & Org.
B. Law 112—Comm. Law	Fin. 112—Fin. Manag.
Manag. 216—Pers. Manag.	

Economics Electives (6 hours).

Recommended Outside Electives:

Psych. 101—Ldrshp. & Hum. Rel.	Spch. 106—Non-Verb. Comm.
Psych. 151—Soc. Psych.	Spch. 111—Hum. Comm.
Psych. 164—Pers. & Soc. Adj.	Engl. 208—Sci./Tech. Writ.

Marketing Research Career Path

Recommended Marketing Core (12 hours):

Mrktg. 113—Mrktg. Research
Mrktg. 115—Dist. Channels
Mrktg. 120—Promo. Manag.
Mrktg. 130—Prod. & Price Pol.

Recommended Marketing Electives (6 hours):

Mrktg. 114—Pers. Selling
Mrktg. 203—Sales Manag.
Mrktg. 205—Cons. Beh.
Mrktg. 207—Bus. Log. Manag.

Required of All Marketing Majors (3 hours):

Mrktg. 211—Marketing Manag.

Recommended Business Electives (9 hours):

Fin. 112—Fin. Manag.
Manag. 112—Quant. Bus. Meth.
Manag. 201—Bus. Info. Syst.
Manag. 210—Bus. Dec.-Mak.
Manag. 220—Det. Dec. Analy.
B. Law 112—Comm. Law
Manag. 205—Ind. & Org.

Recommended Economics Electives (6 hours required):

Econ. 225—Appl. Bus. & Econ. Stat.

Recommended Outside Electives:

Math. 14—Pre-Calc.
Math. 15—Calc. I.
Stat. 212—Intermed. Meth.
Stat. 231—Sampl. Methods
Stat. 251—Data Analysis
C.S. 60—Intro. COBOL
C.S. 61—Intermed. COBOL
Psych. 151—Intro. Soc. Psych.
Psych. 225—Cogni. & Percep.
Psych. 262—Assess. Beh.

Promotion Management Career Path

Recommended Marketing Core (12 hours):

Mrktg. 113—Mrktg. Research
Mrktg. 114—Pers. Selling
Mrktg. 120—Promo. Management
Mrktg. 130—Prod. & Price Pol.

Recommended Marketing Electives (6 hours):

Mrktg. 115—Dist. Channels
Mrktg. 160—Retail Manag.
Mrktg. 203—Sales Manag.
Mrktg. 205—Cons. Behavior

Required of All Marketing Majors (3 hours):

Mrktg. 211—Marketing Manag.

Recommended Business Electives (9 hours):

B. Law 112—Comm. Law
Acctg. 116—Manag. Acctg.
Manag. 160—Mgt. Small Bus.
Manag. 230—Entrepreneurship
Manag. 205—Ind. & Org.
Fin. 112—Financial Manag.

Economics Electives (6 hours).

Recommended Outside Electives:

Journ. 111—Intro. Pub. Rel.
Journ. 113—Princ. Adv.
Journ. 114—Retail Adv.
Journ. 203—Adv. Med. Analy.
Journ 204—Media Manag.
Journ. 251—Dir. Mail Adv.
Psych. 151—Intro. Soc. Psych.
Spch. 80—Intro. Mass Med.
Spch. 221—Persuasion

Bachelor of Science in Economics

Knowledge of economics is essential for the understanding of a wide range of domestic and international issues. In economics courses the use of resources and the processes involved in production, distribution, and consumption of goods and services in the American and other economic systems are systematically studied. Undergraduate study in economics includes analysis of how the economy has developed, how it is organized, and how it functions. It involves analysis of the behavior of components of the economy such as households, businesses, and governments, as well as the pricing, development, and use of resources, and regional and community development.

The Department of Economics offers courses designed to prepare the student for work in government and industry, for additional study in economics at the graduate level, and for professional studies in areas such as law, business administration, and public administration.

On-campus students and transfer students who matriculated at an institution of higher learning during or after August, 1980, may seek admission into the College of Business and Economics upon completion of 58 or more credit hours, attainment of a 2.0 or better grade-point average. The 58-hour total must include the following courses with a grade of C or better: 6 hours of Principles of Economics, 6 hours of Accounting Principles, and a passing grade in Statistics. Students who matriculated initially during or after August 1982, at any institution of higher learning may apply for admission to the College of Business and Economics upon completion of 58 or more credit hours with a 2.25 or better overall grade-point average. The 58 hours must include the following courses with a grade of C or better in each: 6 hours of Principles of Economics, 6 hours of Accounting Principles, and 3 hours of Statistics.

The foregoing are minimum requirements. All students who meet the specific requirements cannot be guaranteed admission to the college. Limitations on admissions may be necessary because of limits imposed by the size of the faculty, other educational resources, and of classroom space.

Students seeking admission to the college must submit a formal application which will be reviewed by a college official to determine eligibility and acceptability of the applicant. Upon admission to the college, students enrolled in the B.S. degree in Economics program are assigned a faculty adviser.

Students who major in economics must complete 62 credit hours in non-economics and non-business courses. These shall consist of University Core Curriculum courses and elective courses (18 hours must be at the upper-division level—courses number 100 through 299).

Non-Business and Non-Economics	*Hr.*	*Total*
Engl. 1 and 2—Composition and Rhetoric	6	
Core Group A Courses	12	
Core Group B Courses (Other than Economics)	6	
Core Group C Courses		
C.S. 5—Computer Applications for Business	4	
Mathamatics (3 and 128 or 15 and 16)	6-8	
(One of two mathematics course sequences is required, either Math. 3 and 128, or Math. 15 and 16. Effective for students entering any college in August 1983 or later.)		
Other Group C electives	4-6	
Other Electives—Non-Business and Economics	23	
Total Non-Business and Economics	62	62
Unrestricted Electives	6	6

B.S. Degree in Economics		
Required College Core Courses:	*Hr.*	
Acctg. 51 and 52—Principles	6	
Econ. 54 and 55—Principles	6	
Econ. 125—Elementary Business and Economics Statistics	3	
Econ. 200—Special Topic: Introductory Econometrics	3	
Econ. 211—Intermediate Microeconomic Theory	3	
Econ. 212—Intermediate Macroeconomic Theory	3	
	24	24

A minimum of 27 upper-division hours in economics, including required courses, is required of all students majoring in economics.

Elective Courses Required in the College:	*Hr.*	
Economics	15	
Business	9	
Economics or Business	12	36
GRAND TOTAL		128

The program cited is effective for students entering the College of Business and Economics (not just the University) during or after August 1983 or later.

Pre-Business Program

Students who plan to pursue one of the areas in business administration should complete 12 hours in Group A approved courses, including Engl. 105; 12 hours of Group B approved courses, including Psych. 1 and Soc. & A. 1; and 13 hours of Group C approved courses, including Math. 3, Math. 28, and C.S. 5.

In addition, students planning to major in Accounting or Finance whose first College matriculation was in August, 1982, or later, should complete Math. 128, Introduction to Calculus, to satisfy a Core C requirement in their sophomore year.

Students must have completed or be taking Econ. 125 (Statistics) before any other 100-level courses in the business and economics "core" can be taken. In addition, such students are restricted to the 100-level business and economics "core" courses and certain specified exceptions until Econ. 125 is completed successfully.

FRESHMAN YEAR				SOPHOMORE YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Psych. 1	3	Engl. 1	3	Econ. 54	3	Econ. 55	3
Math. 3	3	Math. 28	3	Acctg. 51	3	Acctg. 52	3
Core A	3	Soc. & A. 1	3	C.S. 5	4	Engl. 105	3
Core A	3	Core A	3	Engl. 2	3	Econ. 125	3
Core B	3	Core B	3	Core C*	3	Electives—Outside	5
	15		15		16		17

*Accounting and Finance majors must take Math. 128 in lieu of a Core C elective.

Pre-Economics Program

Students who plan to pursue the B.S. degree in Economics must complete 12 hours of Core A courses of their choice; 6 hours of Core B courses of their choice other than in economics; and 12 hours of Core C courses, including a minimum of 6 hours of mathematics (from the following sequences: Math. 3 and 128; or Math. 15 and 16).

Prior to enrolling in any other business or economics course numbered 100 or above, students who are majoring in economics are expected to have completed or to be enrolled in Econ. 125.

FRESHMAN YEAR				SOPHOMORE YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math 3 (or 14), 15, 16, or 128*	3-4	Engl. 1	3	Engl. 2	3	Econ. 55	3
Core A	6	Math 3 (or 14), 15, 16, or 128*	3-4	Econ. 54	3	Acctg. 52	3
Core B	3	Core A	6	Acctg. 51	3	Core A	3
Elective—Outside	3	Core B	3	Econ. 125	3	Electives—Outside	6
		Elective—Outside	3	C.S.	5	Core C	2
	15-16		15-16		17		17

*Economics majors must take one of two sequences: Math. 3 and 128; or Math. 15 and 16.

Pre-Business and Pre-Economics Programs

Students must observe the University Core Curriculum requirements in terms of distribution and number of credit hours being mindful that certain core courses are cited specifically. During the first two years of residence in the University, students should complete the major portion or all of the University Core Curriculum.

While the pre-business program and the pre-economics program are similar, differences do exist. However, students do not suffer materially with a program change.

On-campus students and transfer students who matriculated at an institution of higher learning in or after August, 1980, may seek admission into the College of Business and Economics upon completion of 58 or more credit hours, attainment of a 2.0 or better grade-point average, and completion of each of the following with a grade of C or better: 6 hours of Principles of Economics, 6 hours of Accounting Principles, and a passing grade in Statistics. Similar students who matriculated initially in or after August, 1982, at any institution of higher learning may seek admission into the College of Business and Economics upon completion of 58 or more credit hours, attainment of a 2.25 or better grade-point average, and completion of each of the following with a C grade or better: 6 hours of Principles of Economics, 6 hours of Accounting Principles, and 3 hours of Statistics.

The foregoing are minimum requirements. All students meeting the specific requirements may not be guaranteed admission into the college. Limitations on entry may be necessary depending upon the adequacy and the availability of faculty, other resources, and space.

A formal application must be submitted to the college by students seeking admission and will be reviewed to determine eligibility and acceptability.

B.S. in Business Administration Programs

ACCOUNTING

JUNIOR YEAR				SENIOR YEAR	
First Sem.	*Hr.*	*Second Sem.*	*Hr.*		*Hr.*
Acctg. 111	3	Acctg. 112	3	Acctg. 210	3
Acctg. 115	3	Acctg. 213	3	Acctg. 211 or 217**	3
B. Law 111	3	B. Law 200*	3	Manag. 225	3
Manag. 105	3	Fin. 111	3	Electives—	
Mrktg. 111	3	Econ. 130	3	Bus. & Econ.	9
Elective—Outside	3	Elective—Outside	2	Economics	3
				Unrestricted	6
				Outside	3
	18		17		30

*B. Law 200—The Law and the C.P.A.

**May be taken concurrently. While Acctg. 211 or 217 is required, majors interested in professional accounting positions and examinations are urged to take both courses.

BUSINESS MANAGEMENT

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Manag. 105	3	Acctg. 116	3	Manag. 216	3	Manag. 225	3
B. Law 111	3	Manag. 112	3	Manag. 206	3	Elective— Bus. or Econ.	3
Mrktg. 111	3	Manag. 205	3	Elective— Outside	3	Electives— Unrestricted	6
Fin. 111	3	Elective— Outside	3	Electives— Bus. or Econ.	6	Manag. 201	3
Elective— Economics	3	Electives— Bus. or Econ.	6				
Elective— Outside	2						
	17		18		15		15

Personnel Management Option

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Manag. 105	3	Manag. 216	3	Manag. 201	3	Manag. 225	3
B. Law 111	3	Manag. 111	3	Manag. 206	3	Manag. 217	3
Mrktg. 111	3	Manag. 205	3	B. Law 211	3	Electives— Unrestricted	6
Fin. 111	3	Electives— Bus. or Econ.	6	Econ. 262	3	Elective— Outside	3
Econ. 160	3	Elective— Outside	3	Elective— Bus. or Econ.*	3		
Elective— Outside	2						
	17		18		15		15

*Manag. 218—Focal Points in Management—recommended elective.

Operations Management Option

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Manag. 105	3	I.E. 140	3	Manag. 112	3	Manag. 225	3
B. Law 111	3	Mrktg. 207	3	Manag. 220	3	Manag. 210	3
Mrktg. 111	3	Manag. 111	3	I.E. 261	3	Stat. 231	3
Fin. 111	3	Manag. 201	3	Elective— Economics	3	Elective— Bus. & Econ.	3
Acctg. 116	3	Manag. 205	3	Elective— Outside	2	Electives— Unrestricted	6
Elective— Economics	3	Elective— Outside	2				
	18		17		15		18

Management Science Option

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Manag. 105	3	Manag. 111	3	Manag. 210	3	Manag. 225	3
B. Law 111	3	Acctg. 116	3	Manag. 201	3	Manag. 220	3
Fin. 111	3	Manag. 205	3	Econ. 225	3	Elective— Bus. or Econ.	3
Mrktg. 111	3	Electives— Bus. or Econ.	6	Electives— Outside	5	Electives— Unrestricted	6
C.S. 60	3	Manag. 112	3	Elective— Bus. or Econ.	3		
Elective— Economics	3						
	18		18		17		15

Small Business Option

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
B. Law 111	3	Manag. 160	3	Manag. 230	3	Manag. 225	3
Fin. 111	3	Manag. 111	3	Fin. 115	3	Manag. 260	3
Manag. 105	3	Acctg. 116	3	Manag. 216	3	Elective—	
Mrktg. 111	3	B. Law 112	3	Mrktg. 120	3	Outside	3
Elective—		Elective—		Elective—		Electives—	
Economics	3	Bus. or Econ.	3	Economics	3	Unrestricted	6
Elective—		Elective—					
Outside	2	Outside	3				
	17		18		15		15

FINANCE

Commercial Bank and Financial Institutions Option

JUNIOR YEAR				SENIOR YEAR	
First Sem.	*Hr.*	*Second Sem.*	*Hr.*		*Hr.*
Fin. 111	3	Fin. 112	3	Fin. 200*	3
B. Law 111	3	Fin. 150	3	Fin. 250	3
Manag. 105	3	Fin. 151	3	Fin. 251	3
Mrktg. 111	3	Acctg. 116	3	Fin. 252	3
Econ. 130	3	Electives—		Manag. 225	3
Elective—		Outside	5	Electives—	
Directed				Directed	
Bus. & Econ.	3			Bus. & Econ.	6
				Outside	3
				Unrestricted	6
	18		17		18

*Fin. 200, Special Topic: Working Capital Management.

Corporate Finance Option

JUNIOR YEAR				SENIOR YEAR	
First Sem.	*Hr.*	*Second Sem.*	*Hr.*		*Hr.*
Fin. 111	3	Fin. 112	3	Fin. 150	3
B. Law 111	3	Fin. 115	3	Fin. 151	3
Manag. 105	3	Acctg. 116	3	Fin. 200*	3
Mrktg. 111	3	Econ. 130	3	Manag. 225	3
Elective—		Elective—		Elective—	
Directed		Directed		Directed	
Bus. & Econ	3	Bus. & Econ.	3	Bus. & Econ.	3
Elective—		Elective—		Free Bus. & Econ.	
Outside	3	Outside	2	Electives	6
				Elective—	
				Outside	3
				Electives—	
				Unrestricted	6
	18		17		30

*Fin. 200, Special Topic: Working Capital Management.

Insurance and Risk Management Option

JUNIOR YEAR				SENIOR YEAR	
First Sem.	*Hr.*	*Second Sem.*	*Hr.*		*Hr.*
Fin. 111	3	Fin. 120	3	Fin. 216	3
Fin. 115	3	Mrktg. 111	3	Fin. 220	3
B. Law 111	3	Electives—		Manag. 205	3
Manag. 105	3	Directed		Manag. 225	3
Electives—		Bus. & Econ.	6	Electives—	
Directed		Electives—		Directed	
Outside	3	Outside	5	Bus. & Econ.	6
Bus. & Econ.	3			Free Electives—	
				Bus. & Econ.	6
				Electives—	
				Unrestricted	6
	18		17		30

Real Estate Option

JUNIOR YEAR				SENIOR YEAR	
First Sem.	*Hr.*	*Second Sem.*	*Hr.*		*Hr.*
Fin. 111	3	Fin. 112	3	Fin. 262	3
Fin. 161	3	Fin. 261	3	Fin. 263	3
B. Law 111	3	Acctg. 116	3	Manag. 225	3
Manag. 105	3	Econ. 130	3	Electives—	
Mrktg. 111	3	Elective—		Directed	
Elective—		Directed		Bus. & Econ.	6
Outside	3	Bus. & Econ.	3	Free Electives—	
		Elective—		Bus. & Econ.	6
		Outside	2	Outside	3
				Unrestricted	6
	18		17		30

Security Markets and Investment Option

JUNIOR YEAR				SENIOR YEAR	
First Sem.	*Hr.*	*Second Sem.*	*Hr.*		*Hr.*
Fin. 111	3	Fin. 112	3	Fin. 151	3
Acctg. 116	3	Fin. 150	3	Fin. 250	3
B. Law 111	3	Econ. 130	3	Acctg. 213	3
Manag. 105	3	Mrktg. 111	3	Manag. 225	3
Electives—		Electives—		Electives—	
Directed		Directed		Directed	
Bus. & Econ.		Bus. & Econ.		Bus. & Econ.	
Group 2	3	Group 3	3	Group 1	3
Outside	3	Outside	2	Free Electives—	
				Bus. & Econ.	6
				Outside	3
				Unrestricted	6
	18		17		30

MARKETING

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Manag. 105	3	Mrktg. core*	3	Mrktg. core*	3	Mrktg. 211	3
Mrktg. 111	3	Mrktg. core*	3	Elective—		Manag. 225	3
B. Law 111	3	Mrktg. core*	3	Marketing	3	Elective—	
Fin. 111	3	Elective—		Elective—		Marketing	3
Elective—		Economics	3	Bus. or Econ.	3	Elective—	
Economics	3	Elective—		Elective—		Bus. or Econ.	3
Elective—		Bus. or Econ.	3	Outside	3	Elective—	
Outside	3	Elective—		Elective—		Unrestricted	3
		Outside	2	Unrestricted	3		
	18		17		15		15

*Marketing Core courses must be selected from the following: Mrktg. 113, 114, 115, 120, 130.

B.S. in Economics Program

The economics program is designed for those who wish to emphasize economics in their education for a business career, undertake graduate work for an advanced degree in this field, or for government service.

The student must earn at least 60 hours in upper-division courses (numbered 100 or higher). The apparent excess requirement of 6 hours (total 66 hours indicated under each program) provides for the completion of the University Core Curriculum program, which may be at the lower-division (courses numbered 1 to 99) or upper-division levels. However, the student must take a minimum of 18 hours of upper-division, non-business and economics electives in the economics program.

JUNIOR YEAR				SENIOR YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Econ. 211	3	Econ. 212	3	Elective—		Econ. 200*	3
Elective—		Elective—		Bus.	3	Electives—	
Bus.	3	Bus.	3	Electives—		Bus. or Econ.	6
Elective—		Electives—		Econ.	6	Electives—	
Econ.	3	Econ.	6	Elective—		Unrestricted	6
Electives—		Elective		Bus. or Econ.	3		
Outside	9	Outside	3	Elective—			
		Elective—		Outside	3		
		Bus. & Econ.	3				
	18		18		15		15

*Special Topic—Introduction to Econometrics.

University Core Curriculum Courses

The following courses in the College of Business and Economics meet the University criteria to qualify for Core Curriculum credit:

Economics 51, 54-55, 110, 130, 160, 200, 211-213, 216, 241, 245-246, 250, 255, 257, 262-263, 270, 279—*Core B.*

Courses of Instruction

Accounting (Acctg.)

51. *Principles of Accounting.* I, II. 3 hr. PR: Sophomore standing. The accounting cycle from the analysis of business transactions through the preparation of financial statements; basic theory and practice with respect to accounting for assets and equities.

52. *Principles of Accounting.* I, II. 3 hr. PR: Acctg. 51. Utilization of accounting information for purposes of managerial control and decision making; cost concepts, profit and financial budgeting, analysis of financial statements.

111. *Intermediate Accounting.* I. 3 hr. PR: Acctg. 52. Development of accounting theory and practice, with emphasis on asset accounting.

112. *Intermediate Accounting.* I or II. 3 hr. PR: Grade of C or better in Acctg. 111. Theory and practice with respect to accounting for liabilities and stockholder's equity; special problems peculiar to financial accounting; analysis of financial statements and changes in financial position.

115. *Cost Accounting.* I, II. 3 hr. PR: Acctg. 52. Fundamentals of cost determination with emphasis on the significance of cost data and their interpretation; process, job-order, and standard costs.

116. *Managerial Accounting.* II. 3 hr. *(No credit available to students having credit for Acctg. 115.)* PR: Acctg. 52. For non-accounting majors. Analysis of internal accounting practices with emphasis on use of data for performance evaluation, control, motivation through accounting systems, and decision-making.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Acctg. 112 or consent. Special topics relevant to accounting. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward bachelor's and master's degrees.)*

210. *Advanced Accounting.* I, II. 3 hr. PR: Grade of C or better in Acctg. 112, or written consent. Accounting for partnerships, consolidations, foreign exchanges, and governmental (nonprofit) entities.

211. *Accounting Systems.* I. 3 hr. PR: C.S. 5, Acctg. 115 or 116. Analysis of data processing fundamentals and information systems analysis, design, and implementation, including necessary computer hardware and software components with particular reference to accounting information systems and the controls necessary therein.

213. *Income Tax Accounting.* I. 3 hr. PR: Acctg. 111 or 115 or 116 or consent. Tax laws and the investment and business decisions they affect. Taxes are presented in meaningful relationships in order to form a general pattern of knowledge that is easier understood.

214. *Income Tax Accounting.* II. 3 hr. PR: Acctg. 111 or 115 or 116 or consent. Emphasis on income tax practice as developed from the Internal Revenue Code, regulations, rulings and court decisions. Cases and problems covering individuals, partnerships, corporations, and estate and gift returns.

216. *Advanced Managerial Accounting.* II. 3 hr. PR: Acctg. 111 and 115 or 116. Special problems in cost accounting, including tax planning, inventory control, and decision models on C.P.A./C.M.A. examination. Selected problems and cases will be used.

217. *Auditing Theory.* I or II. 3 hr. PR or Conc.: Acctg. 210. Auditing fundamentals; objectives, ethics, statistical samplings, standards and procedures. Emphasis on FASB and SAS disclosures.

218. *Auditing Practice.* I or II. 3 hr. PR: Consent. Application of auditing theory and procedures, with emphasis on decisions which invoke judgment and are important in independent audits; audit working papers and reports; case studies. *(Course will not be offered in 1982-83.)*

224. *Advanced Accounting Problems.* I or II. 3 hr. PR: Minimum of 18 hr. in accounting with an average grade of B or higher. Analysis and solution of representative C.P.A. problems. *(Course will not be offered in 1983-84.)*

230. *Advanced Accounting Theory.* I or II. 3 hr. PR: Acctg. 112, 115, and consent. Critical analysis of accounting concepts and standards with emphasis on their origin, development, and significance. *(Course will not be offered in 1983-84.)*

299. *Independent Study.* I, II, S. 1-3 hr. PR: Consent. Students will develop and complete a program of specialized studies under the supervision of a cooperating instructor.

Business Law (B. Law)

111. *Legal Environment of Business.* I, II. 3 hr. The nature of law and the judicial system. The relationship of law, ethics, and cultural values to the business enterprise. Substantive law of contracts, sales, and credit transactions and the social and economic consequences of court decisions.

112. *Commercial Law.* I, II. 3 hr. PR: B. Law 111. Substantive law of agency, partnerships, corporations, negotiable instruments, and property and their social and economic functions.

200. *Special Topics.* I, II. S. 1-4 hr. PR: B. Law 112 or consent. Special topics relevant to business law. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward bachelor's and master's degrees.)*

211. *Personnel Relations and the Law.* I, II. 3 hr. The legal principles guiding employer-employee relations, including agency law and the law regulating employee health, safety, compensation and benefits, job opportunity, and labor organizing.

Economics (Econ.)

51. *The Economic System.** I, II. 3 hr. The pricing system, monetary system, determination of national income, and employment. A one-semester principles course for non-majors.

54. *Principles of Economics.* I, II. 3 hr. PR: Sophomore standing. Elementary microeconomic analysis.

55. *Principles of Economics.* I, II. 3 hr. PR: Econ. 51, 54, and sophomore standing. Elementary macroeconomic analysis.

110. *Comparative Economic Systems.* I or II. 3 hr. PR: Econ. 51 or 55. Structure and processes of existing economic systems throughout the world including review of basic principles of free enterprise, socialistic, communistic, and fascistic societies. Comprehensive analysis based on current and recent experiments in these economies.

125. *Elementary Business and Economic Statistics.* I, II, S. 3 hr. PR: Grade of C or better in either Math. 3 or 14 or consent. Basic concepts of statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regression and correlation with emphasis on business and economic examples. *(Equiv. to Stat. 101.)*

*Students who have completed Econ. 51 and who wish to take another economics course may take Econ. 54, 55, or any 100- or 200-level economics course for which they have the prerequisites.

130. *Money and Banking.* I, II. 3 hr. PR: Econ. 51 or 55. Our system of monetary and banking arrangements, viewed in relation to functioning of the economic system as a whole.

160. *Labor Economics.* I, II, S. 3 hr. PR: Econ. 51 or 55. Survey of labor in the United States economy. Introduction of theories of employment and wage determination. Topics include labor history and law, the changing work roles of women, minority opportunities, and the problem of unemployment.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Econ. 51 or 55 or consent. Special topics relevant to economics. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward bacholor's and master's degrees.)*

205. *Current Economic Problems.* S. 3 hr. PR: Econ. 51 or 55 or consent. *(For students in Education only.)* Acquaints public school teachers with reliable source materials in economics in studying current economic problems.

211. *Intermediate Microeconomic Theory.* I, II. 3 hr. PR: Econ. 51 or 54. Consumer choice and demand; economics of time; price and output determination and resource allocation in the firm and market under a variety of competitive conditions; welfare economics, externalities, public goods, and market failure.

212. *Intermediate Macroeconomic Theory.* I, II. 3 hr. PR: Econ. 51 or 55. Forces which determine the level of income, employment, and output. Particular attention to consumer behavior, investment determination, and government fiscal policy.

213. *Economic Development.* I or II. 3 hr. PR: Econ. 51 or 55. The problems, changes, and principal policy issues faced by nonindustrialized countries.

216. *History of Economic Thought.* I or II. 3 hr. PR: Econ. 51 or 55. Economic ideas in perspective of historical development.

220. *Introduction to Mathematical Economics.* I or II. 3 hr. PR: Math. 15 or 128, and Econ. 51 or 55; or consent. Principal mathematical techniques including set operation, matrix algebra, differential and integral calculus employed in economic analysis. Particular attention given to static (or equilibrium) analysis, comparative-static analysis and optimization problems in economics.

225. *Applied Business and Economic Statistics.* I, II. 3 hr. PR: Econ. 125 or Stat. 101 or consent. Continuation of Econ. 125. Principal statistical methods used in applied business and economic research including multiple regression, index numbers, time series analysis, forecasting models and methods, and sampling design.

241. *Public Finance.* I, II. 3 hr. PR: Econ. 51 or 55. Governmental fiscal organizations and policy; taxes and tax systems with particular emphasis on the federal government and the state of West Virginia.

245. *Government and Business.* I, II. 3 hr. PR: Econ. 51 or 55. Market structure, conduct, and performance: analysis of the antitrust laws—judicial interpretation and effect on the business sector.

246. *Transportation Economics.* I or II. 3 hr. PR: Econ. 51 or 55. Economic and institutional analysis of the domestic transportation system of the United States. Topics include role of transportation, carrier characteristics and services, transportation rates and costs, regulation of transportation.

250. *International Economics.* I or II. 3 hr. PR: Econ. 51 or 55. Development of trade among nations; theories of trade, physical factors, trends, and barriers in international economics.

255. *Regional Economics.* I or II. 3 hr. PR: Econ. 51 or 55. Analysis of the regional economy's spatial dimension, emphasizing interregional capital and labor mobility, the role of cities, objectives and issues of regional policy, lagging regions and Appalachia, growth poles, and regional growth and income distribution.

257. *Urban Economics.* II. 3 hr. PR: Econ. 51 or 55. Analyzes the spatial dimensions of urban economy, emphasizing both urban economic theory and urban policy. Issues include cities and income inequality, urban upgrading function, blight, economics of ghettos, the economies of urban size.

262. *Collective Bargaining.* I or II. 3 hr. PR: Econ. 160 or consent. Theory and practice of collective bargaining; contract issues; types of relationships, and the role of government policy.

263. *Labor Market Analysis.* I or II. 3 hr. PR: Econ. 160 or consent. Determination of wage levels and structure; economic and institutional forces determining wage levels and differentials.

270. *Growth of the American Economy.* I or II. 3 hr. PR: Econ. 51 or 55. Central issues in the development of the American economy.

297. *Internship.* I, II, S. 1-12 hr. PR: Econ. 51 or 55 and departmental approval. Field experience in the analysis and solution of economic problems in the public and private sectors.

299. *Readings in Economics.* I, II, S. 1-3 hr. PR: Econ. 51 or 55. Students will develop and carry out a program of specialized readings under the supervision of a cooperating instructor.

Finance (Fin.)

111. *Business Finance.* I, II. 3 hr. PR: Acctg. 51 and 52. Activities of the finance manager in the planning, acquisition, and administration of funds used in a business enterprise.

112. *Financial Management.* II. 3 hr. PR: Fin. 111; (Grade of C or better in Fin. 111 by finance majors.) Application of fundamentals and theory of the analysis of cases in business finance.

115. *General Insurance.* I, II. 3 hr. Theory of risk and its application to insurance; principles underlying insurance—life, property, casualty, fire, and surety.

120. *Life Insurance.* I. 3 hr. PR: Fin. 115. Principles of life and health insurance protection. Application of life insurance to individual, family, business, and societal needs.

150. *Investments.* I, II. 3 hr. PR: Fin. 111 or consent. Investment analysis and management for the individual and the financial institution.

151. *Financial Institutions.* I, II. 3 hr. PR: Fin. 111 and Econ. 130. The role of financial institutions in our nation's financial markets and the economy. Analysis of interest rate, financial markets and federal revenue policy.

161. *Real Estate.* I, II. 3 hr. Principles and practices of real estate business.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Fin. 111 or consent. Special topics relevant to finance. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward bachelor's and master's degrees.)*

212. *Working Capital Management.* I. 3 hr. PR: Fin. 111, Econ. 125. Covers the management of current assets and liabilities. Topics include management of cash, marketable securities, accounts receivable, inventories, trade accounts payable, and short-term bank borrowings. Decision models are used extensively.

216. *Risk Management.* II. 3 hr. PR: Fin. 115 or consent. Transferable risks with which the entrepreneur must deal. Emphasis on the process by which decisions are made for handling these risks, including an examination of contributions and limitations of insurance system.

220. *Social Insurance.* I. 3 hr. Our social and political efforts to provide economic security for the general public. An examination of the parallel developments of private insurance.

250. *Security Analysis and Portfolio Management.* II. 3 hr. PR: Fin. 150 or consent. The systematic selection, assessment, and ranking of corporate securities in a portfolio framework through a synthesis of fundamental analysis, technical analysis, and random walk.

251. *Bank Management 1.* I, II. 3 hr. PR: Fin. 111. The management of commercial bank funds. Examination of principles applicable to the various types of lending and investing within legal restraints of government.

252. *Advanced Bank Management.* II. 3 hr. PR: Fin. 251. An advanced course in commercial banking involving problems of management of the money position, loan and investment portfolio and capital adequacy. The student simulates actual bank operation, conducts case studies, and analyzes bank performance.

261. *Real Estate Appraising.* 3 hr. PR: Fin. 161. The appraisal problem, plan the approach, acquire, classify, analyze and interpret data into an estimate of value by the use of the cost or replacement approach, income approach, and market approach.

262. *Real Estate Finance.* 3 hr. PR: Fin. 111, 161. How financing, the tax system, and supply and demand interact to create values which, when coupled with investment decision, leads to choosing an investment strategy in real estate.

263. *Real Estate Investments/Land Development.* 3 hr. PR: Fin. 161. Designed to investigate various types of real estate investments including apartments, office buildings, shopping centers, and residential land developments with emphasis on financial analysis, profitability analysis, and rates of return.

299. *Independent Study.* I, II, S. 1-3 hr. PR: Consent. Students will develop and complete a program of specialized studies under the supervision of a cooperating instructor.

Management (Manag.)

105. *Contemporary Management.* I, II. 3 hr. PR: To be taken by business students in their first semester in the College of Business and Economics. A study of management as a process of planning, organizing, directing and controlling business activities with economic, social, and behavioral influences. Introduction to organizational behavior theory and systems theory concepts.

111. *Operations Management.* I, II, S. 3 hr. PR: C.S. 5, Manag. 105, and Econ. 125 or consent. A survey of management operations problems, including the areas of inventory control, scheduling, quality control, facility design, and work analysis.

112. *Quantitative Business Methods.* I, II, S. 3 hr. PR: C.S. 5 and Econ. 125 or consent. A survey of quantitative tools and techniques with emphasis on applications in accounting, finance, marketing, personnel, and operations functions, both singly and in combination.

160. *Management of Small Business.* I, II. 3 hr. PR: Manag. 105. Focusing on the management of small business, the course is designed both for those seeking employment in small business, and for those entering large organizations which deal with small firms as suppliers, customers, and competitors.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Manag. 105 or consent. Special topics relevant to management. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College of Business and Economics may be applied toward bachelor's and master's degrees.)*

201. *Business Information Systems.* I, II. 3 hr. PR: Manag. 105, Fin. 111, Mrktg. 111, Acctg. 52, C.S. 5. Use of EDP for decision making with emphasis on application in the functions of finance, marketing, personnel, accounting, and operations management. 3 hr. lec., 3 hr. lab.

205. *The Individual and the Organization.* II. 3 hr. Examination of how the individual, the group, and the organization interact to influence the behavior of the business organization and that of its human resources.

206. *Organizational Theory and Analysis.* II. 3 hr. PR: Manag. 205 or consent. Influences of structure on the behavior and dynamics of the business organization. Attention on how to be an effective manager.

210. *Business Decision-Making Under Uncertainty.* II. 3 hr. PR: Manag. 112 or C.S. 5 and Manag. 111. Analysis of business problems where certainty does not exist. The case approach with actual or realistic data involving more than one business functional area. Solution of unique business problems.

213. *Problems in Business Administration.* I, II, S. 1-3 hr. Selected management problems related to the total enterprise and the emerging technostructure, e.g., managerial and corporate strategy, utilization of resources, social responsibility and government relations, dynamics of new industries.

216. *Personnel Management.* I, II. 3 hr. Leading and motivating people whose work behavior is influenced by technology, organization, and management style as those affect the individual and work groups.

217. *Personnel and Compensation.* I, II. 3 hr. PR: Manag. 216. Designing and implementing total compensation systems in both private and public sectors. The emerging elements of total compensation systems are included providing insights into problems and opportunities for personnel.

218. *Focal Points in Management.* I, II. 1-3 hr. PR: Manag. 105. In-depth study of specialized management subjects, e.g., personnel interviewing, job descriptions, consulting, or organizational development. *(Each subject is self-contained, spans one-third of a semester, and is valued at 1 credit hour.)*

220. *Deterministic Decision Analysis.* I. 3 hr. PR: Manag. 112. Study and application of quantitative methods to business problems in which deterministic conditions prevail.

225. *Business Policy.* I, II. 3 hr. PR: Senior standing and consent. Integrated study of policies, organization, facilities, and control techniques of business enterprises.

230. *Enterpreneurship.* I, II. 3 hr. PR: Manag. 160. The role of the entrepreneur in business and society; includes an analysis of the individual entrepreneur, and investigates the nature and problems of establishing a new business enterprise.

260. *Practicum in Small Business.* I, II. 3 hr. PR: Manag. 160. A practical training ground in the identification and solution of small business problems. Through interaction with the business community, students are exposed to the opportunities and difficulties of small business entrepreneurship.

299. *Independent Study.* I, II, S. 1-3 hr. PR: Consent. Students will develop and complete a program of specialized studies under the supervision of a cooperating instructor.

Marketing (Mrktg.)

111. *Introduction to Marketing.* I, II. 3 hr. PR: Econ. 54, 55. Specific functional areas studied include sales management; consumer behavior; market research; product management; promotion management; distribution management; and price policies.

113. *Marketing Research.* I, II. 3 hr. PR: Mrktg. 111. Scientific approach to the solution of marketing problems with emphasis on research methods and techniques.

114. *Personal Selling.* I, II. 3 hr. PR: Mrktg. 111. Deals with interpersonal communication, influencing, and persuasion processes designed to satisfy customer and company needs; stresses the structure of sound sales presentations through lectures, persuasive presentations, and appraisal and correction of common selling errors.

115. *Distribution Channels.* I, II. 3 hr. PR: Mrktg. 111. Management of channel systems with emphasis on retail distribution, channel choice, strategies, control, and optimization within the context of role, power, conflict, and communications.

120. *Promotion Management.* I, II. 3 hr. PR: Mrktg. 111. An analysis of the promotional mix options; advertising; personal selling; and sales promotion, and the integration of these options into the marketing mix.

130. *Product and Price Policies.* I, II. 3 hr. PR: Mrktg. 111. Deals with the company's product offering as economic and marketing variables influencing product's price; stress on determination of product and price objectives, planning, implementation, and evaluation of results.

160. *Retail Management.* I, II. 3 hr. PR: Mrktg. 111. The organization and operating environment of retail firms. Special emphasis placed on consumer market segmentation and the marketing variables of merchandise mix, effective pricing, store location, and communication with suppliers and consumers.

200. *Special Topics.* I, II, S. 1-4 hr. PR: Mrktg. 111 or consent. Special topics relevant to marketing. *(Maximum of 9 semester hours in any or all courses numbered 200 offered by the College may be applied toward bachelor's and master's degrees.)*

201. *Focal Points in Marketing.* I. 1-3 hr. PR: Mrktg. 111. In-depth study of specialized marketing subjects, e.g., franchising, tourism, packaging, or product development. *(Each subject is self-contained, spans one-third of a semester, and is valued at 1 credit hour.)*

203. *Sales Management.* II. 3 hr. PR: Mrktg. 114. Concentrates on the managerial responsibilities of sales managers for directing, motivating, and controlling a sales force plus the techniques of selling including handling objections and closing.

205. *Consumer Behavior.* II. 3 hr. PR: Mrktg. 111. The consumer decision process in a marketing framework. Emphasis on psychological and sociological concepts which influence the decision process.

207. *Business Logistics Management.* I, II. 3 hr. PR: Mrktg. 115 or consent. Examination of transportation, warehousing, materials handling, containerization, inventory control, purchasing, and warehouse location. Significant use made of problem solving with analytical tools.

210. *Industrial Marketing.* I. 3 hr. PR: Mrktg. 111. A study of marketing to three classes of customers: the industrial market, the institutional market, and government agencies.

211. *Marketing Management.* I, II. 3 hr. PR: Mrktg. 111; 12 hr. of marketing or consent. Simulation, through live and written case study, should sharpen skills as the student makes analytical evaluations of marketing problems.

299. *Independent Study.* I, II, S. 1-3 hr. PR: Consent. Students will develop and complete a program of specialized studies under the supervision of a cooperating instructor.

College of Creative Arts

Creative development in art, music, and theatre is the purpose of the College of Creative Arts of West Virginia University. A distinguished faculty of musicians, actors, directors, and artists brings to the center's outstanding facilities a commitment to a creative process of artistic growth which is shared with each student. Here, in a rich environment of plays, art exhibits, and concerts, the student is offered the knowledge, skills, and inspiration necessary for professional success.

The Division of Art offers a faculty of practicing artists and scholars prepared to train dedicated students for careers as professional artists or teachers of art. While practicing your art in the College of Creative Arts studios you may work toward a degree concentrating in any of the following specialities: Art Education, Ceramics, Graphic Design, Painting, Printmaking, and Sculpture.

The Division of Music offers the opportunity to perform, study, and compose music of all styles under the guidance of an expert faculty of artist performers, teachers, and scholars. Performing groups include the Marching Band, Concert Band, Wind Ensemble, University Choirs, Opera Theatre, Symphony Orchestra, Percussion Ensemble, Jazz Ensembles, Collegium Musicum, and many others.

Degrees are offered with concentration in: Music Education, Performance, Music History, Composition, and Music Theory.

Advanced standing in the Division of Music in Applied Music and Music Theory is given only after examination.

The Division of Theatre offers concentrated training programs in four different areas of the theatre arts and crafts. An outstanding faculty works closely with the undergraduate major both in the classroom and in three campus theatres, as well as on tour with the WVU Puppet Mobile.

Degrees are offered with concentration in any one of the following areas: Acting-Directing-Oral Interpretation, Design-Technical Theatre, Acting-Voice, and General Theatre.

Auditions for scholarships in music and theatre are scheduled throughout the school year. For information or an appointment, write the Chairperson, Division of Music or Theatre, College of Creative Arts, West Virginia University, Morgantown, WV 26506, or telephone (304) 293-4841.

Students transferring to the College of Creative Arts from other colleges and universities are required to present a minimum grade-point average of 2.0. Exceptions may be made in the case of first-semester freshman students.

The College of Creative Arts reserves the right not to offer courses in the listed semester on the basis of low enrollment, change in curriculum, availability of faculty, or other reasons at the convenience of the College of Creative Arts.

Complete information concerning WVU admissions, registration, tuition and fees, and regulations is in Part 2 of the *WVU Undergraduate Catalog*.

University Core Curriculum Courses

The following courses in the College of Creative Arts meet the University criteria to qualify for Core Curriculum credit:

Art 3, 30, 100, 105-106, 200—*Core A*.

Music 19, 30-31, 33-34, 61-68, 100, 102-103, 105, 110, 113, 115, 129-130, 135-138, 160, 171-172, 174, 200, 213, 218-219, 221-225, 230, 239, 243, 260, 263-268, 299—*Core A*.

Theatre 30, 50, 74, 95, 106, 180, 195-196, 200, 251, 282, 290-291, 295-298—*Core A.*

Application for Graduation and Diploma

All candidates for degrees in the College of Creative Arts must fill out an application for graduation and diploma at the College of Creative Arts' Undergraduate Records Office. Candidates should make such application during the second semester of their junior years in order to have their records evaluated as to College of Creative Arts and University requirements. Application must be made during the first month of the semester or summer session in which the candidate expects to be graduated. If a student does not, for some reason, graduate on the date for which the student applied initially, the student must re-apply for a later date. No candidate can be graduated without application.

Faculty

Wayne M. Sheley, D.M.A. (Eastman Sch. of Mus.), *Dean of College of Creative Arts; Professor of Music.*
Richard E. Duncan, Ph.D. (Eastman Sch. of Mus.), *Dean and Professor Emeritus.*

Division of Art

Gary F. Edson, M.F.A. (Tulane U.), *Chairperson and Professor of Art.*
Robert P. Anderson, Jr., M.F.A. (Alfred U.), *Associate Professor of Art.*
Peter E. Charles, M.F.A. (Yale U.), *Associate Professor of Art.*
John D. Clarkson, M.A. (U. Pitt), *Professor Emeritus.*
Urban Couch, M.F.A. (Cranbrook Acad. Art), *Professor of Art; Curator, WVU Galleries/Art Collection.*
Barbara A. Drainer, Ed.D. (Columbia U.), *Professor Emeritus.*
Beth Bandi Durkin, M.A. (WVU), *Visiting Instructor in Art.*
Miriam D. Edson, B.F.A. (I.U. at Ind.), *Lecturer (part-time) in Art.*
David L. Faber, M.F.A. (So. Ill. U.), *Assistant Professor of Art.*
Ben F. Freedman, M.A. (U. Ariz.), *Professor of Art.*
L. Victor Haines, *Lecturer (part-time) in Art.*
Clifford A. Harvey, B.F.A. (Mpls. C. Art & Des.), *Professor of Art.*
Stephen Lawson, M.F.A. (U. Colo.), *Assistant Professor of Art.*
Wendell E. McPherson, *Instructor (part-time) in Art.*
Michael E. Morin, M.F.A. (SUNY), *Visiting Assistant Professor of Art.*
Margaret T. Rajam, Ph.D. (U. Mich.), *Professor of Art.*
John B. Schultz, Ph.D. (U. Pitt), *Assistant Professor of Art.*
Rosalyn Schwartz, M.F.A. (Fontbonne C.), *Assistant Professor of Art.*
Eve F. Small, M.F.A. (R.I. Sch. Design), *Assistant Professor of Art.*
William J. Thomas, M.A. (Phila. C. Art), *Associate Professor of Art.*

Division of Music

Cecil B. Wilson, Ph.D. (Case West. Res. U.), *Chairperson and Professor of Music.*
Dawn S. Baker, Ph.D. (U. Md.), *Associate Professor of Music. Music Education.*
John Beall, Ph.D. (Eastman Sch. of Mus.), *Associate Professor of Music. Composition, Theory.*
James W. Benner, M.A. (Columbia U.), *Professor of Music. Vocal Diction, Repertoire; Opera Theatre; Piano.*
Clifford W. Brown, M.F.A. (Carnegie-Mellon U.), *Professor Emeritus.*
Thomas S. Brown, Ph.D. (Northwestern U.), *Associate Professor of Music. Music Education.*
Thomas S. Canning, M.M. (Eastman Sch. of Mus.), *Professor Emeritus.*
Joyce A. Catalfano, M.M. (Ithaca C.), *Assistant Professor of Music. Flute; Coordinator, Woodwinds.*

Jon Crain, *Professor of Music. Voice.*
Rose M. Crain, *Associate Professor of Music. Voice.*
Oswald DePaul, *Lecturer (part-time) in Music. Violin.*
Joseph H. Eckert, M.M. (N. Tex. St. U.), *Assistant Professor of Music. Saxophone, Jazz Ensemble.*
Lawrence A. Edwards, M.S. (U. Ill.), *Assistant Professor of Music. Conducting; Director of Choral Activities.*
Harry Elzinga, Ph.D. (Ind. U.), *Professor of Music. Musicology. Collegium Musicum.*
Clyde N. English, D.S.M. (Union Theol. Sem.), *Professor Emeritus.*
Philip J. Faini, M.M. (WVU), *Professor of Music. Percussion, African Music. Coordinator, Brass-Percussion.*
John A. Ferrillo, Cert. (Curtis Inst.), *Assistant Professor of Music. Oboe, Theory.*
Herman Godes, M.M. (Latvian St. Mus. Acad.), *Professor of Music. Piano. Coordinator, Keyboard.*
Reginald W. Goeke, Ed.D. (U. Ill.), *Assistant Professor of Music. Music Education. Coordinator, Music Education.*
Joseph A. Golz, M.A. (Columbia U.), *Professor Emeritus.*
William P. Haller, D.M.A. (N. Tex. St. U.), *Associate Professor of Music. Organ, Theory.*
Stephen M. Heyde, M.M. (Carnegie-Mellon U.), *Assistant Professor of Music. Violin; Assistant Director, Orchestras.*
Leo Horacek, Jr., Ph.D. (U. Kans.), *Professor Emeritus.*
Barton Hudson, Ph.D. (Ind. U.), *Professor of Music. Musicology, Harpsichord. Coordinator, Music History-Literature.*
Jere T. Humphreys, M.M. (Fla. St. U.), *Assistant Professor of Music. Music Education.*
John C. Hunt, M.M. (Cath. U. Am.), *Assistant Professor of Music. Bassoon, Theory.*
Christine B. Kefferstan, M.M. (U. Cincinnati), *Instructor in Music. Piano.*
Gerald Lefkoff, Ph.D. (Cath. U. Am.), *Professor of Music. Theory, Electronic Music, Composition, Viola.*
Frank E. Lorince, Jr., Ph.D. (Eastman Sch. of Mus.), *Professor of Music. Theory, Coordinator, Theory-Composition.*
Margaret S. Lorince, M.M. (Eastman Sch. of Mus.), *Professor of Music. Coordinator, Music Preparatory Programs.*
Jeffrey T. Mangone, B.S.M.E. (Duquesne U.), *Lecturer (part-time) in Music. String Bass.*
David P. McCollum, M.M. (Duquesne U.), *Lecturer (part-time) in Music. Tuba.*
Bernard R. McGregor, M.F.A. (Carnegie-Mellon U.), *Associate Professor Emeritus of Music.*
James E. Miltenberger, D.M.A. (Eastman Sch. of Mus.), *Professor of Music. Piano, Piano Repertoire.*
Jane R. Pestun, M.M. (WVU), *Assistant Professor of Music. Piano.*
Donald C. Portnoy, D.M.A. (Peabody Conserv. Mus.), *Professor of Music. Violin; Conducting; Director of Orchestral Activities; Coordinator, Strings.*
Richard E. Powell, M.Ed. (S.W. Tex. St. C.), *Professor of Music. Low Brass Instruments, Theory.*
George E. Schafer, Ph.D. (Eastman Sch. of Mus.), *Professor Emeritus of Music.*
Roger Sherman, M.M. (Eastman Sch. of Mus.), *Lecturer (part-time) in Music. Trumpet.*
William Skidmore, M.M. (U. Ill.), *Associate Professor of Music. Cello, Chamber Music.*
Ethan Sloane, D.M.A. (Yale U.), *Associate Professor of Music. Clarinet, Chamber Music.*
Edward A. Sprague, M.S. (Syracuse U.), *Associate Professor of Music—University Extension.*
June D. Swartwout, M.M. (WVU), *Associate Professor of Music. Voice; Coordinator, Voice—Opera.*
William Taylor, M.M. (Ind. U.), *Associate Professor of Music. Voice.*
Gilbert Trythall, D.M.A. (Cornell U.), *Professor of Music. Theory, Composition.*
Dale L. Whitman, D.M.A. (Cath. U. Am.), *Assistant Professor of Music. Horn, Theory.*
Don G. Wilcox, M.A. (Cal. St. C., L. Bch.), *Professor of Music. Theory, Conducting; Director of Bands.*
Christopher Wilkinson, Ph.D. (Rutgers U.), *Assistant Professor of Music. Musicology, Theory; Acting Coordinator, Graduate Studies.*

John R. Winkler, M.M. (Northwestern U.), *Assistant Professor of Music. Trumpet; Theory; Brass Ensembles.*
Albert J. Wrublesky, M.M. (WVU), *Lecturer (part-time) in Music. Percussion.*
Frances Yeend, *Professor Emerita; Lecturer (part-time) in Music. Voice.*

Division of Theatre

Jon S. Whitmore, Ph.D. (U. Calif.), *Chairperson and Professor of Theatre.*
Donald E. Biehn, M.F.A. (Goodman Drama Sch.), *Assistant Professor of Theatre.*
Mary Kathyrn Gonder Brindle, M.A. (WVU), *Assistant Professor of Theatre.*
James Brown, M.F.A. (U. Wash.), *Assistant Professor of Theatre.*
Robert B. Burrows, Ph.D. (Ohio St. U.), *Professor Emeritus of Theatre.*
Joe E. Ford, M.A. (WVU), *Professor Emeritus of Theatre.*
Brackley Frayer, M.F.A. (Yale U.), *Assistant Professor of Theatre.*
James H. Gage, M.F.A. (Yale U.), *Assistant Professor of Theatre.*
Frank Gagliano, M.F.A. (Columbia U.), *Claude Worthington Benedum Professor of Theatre.*
Judith K. Johnson, M.F.A. (U. Iowa), *Assistant Professor of Theatre.*
Eugene Lesser, M.F.A. (Carnegie-Mellon U.), *Visiting Professor of Theatre.*
Charles D. Neel, Ph.D. (Cornell U.), *Professor of Theatre.*
Joann Spencer Siegrist, M.F.A. (U. Ga.), *Assistant Professor of Theatre.*
Albert D. Tucci, M.F.A. (Art Inst. Chicago.), *Associate Professor of Theatre.*
David Wanstreet, B.S. (WVU), *Instructor (part-time) in Theatre.*
John C. Whitty, Ph.D. (U. Iowa), *Professor of Theatre.*

Division of Art

The curriculum of the Division of Art is designed to afford the art student an opportunity to explore the primary fields of the visual arts. Undergraduate programs offer a full range of scholarly and studio experiences to potential artists and teachers. The in-depth instruction is enhanced by the close working relationship between students and faculty which allows the sharing of the creative insights and investigative processes of a staff of professional artists and scholars.

The Bachelor of Fine Arts (B.F.A.) or Bachelor of Arts (B.A.) degree is conferred upon those students who satisfy all University and department requirements, complete the appropriate curriculum, and comply with the general regulations of the University concerning degrees.

A candidate for a degree in the Division of Art must maintain a minimum grade-point average of 2.0 (C). In addition, students may be requested to present a portfolio of selected works for examination and evaluation by a faculty committee. The committee shall be empowered to make recommendations regarding the student's continuing work toward a degree in art.

Transfer applicants must establish transfer credit from other institutions during the first semester in which they are enrolled in the Division of Art. Evaluation for advanced standing or transfer credit in studio subjects will not be made solely upon the presentation of a transcript but may also depend on the evaluation of a portfolio of art work. The Division of Art reserves the right to require a portfolio examination if there is doubt or question about the acceptance of transfer credits to be used in lieu of courses in the art area. Transfer credits may not be accepted in the major studio area.

The Division of Art is accredited by the National Association of Schools of Art and Design.

Bachelor of Fine Arts Curriculum (B.F.A.)

The Bachelor of Fine Arts (B.F.A.) is a professional degree awarded to those persons who have satisfactorily completed the required 128 semester credit hours of study and made the expected commitment to the vocation of art. This degree program requires an amount of self-education based on a sound foundation of studio experience. Students in the B.F.A. curriculum may participate in a wide range of studio studies, including drawing, design, painting, printmaking, ceramics, graphic design, and sculpture, and a program of art history. Through careful counseling, individual goals and objectives are established in keeping with the student's creative aims.

The Division of Art of WVU is commited to providing the opportunity and the environment for the best possible education in the visual arts at both the undergraduate and graduate levels. The Division of Art program of professional education is centered in the studio arts and reinforced with art historical and liberal arts studies. Students are encouraged to take advantage of the broad range of educational possibilities available in other areas of the University and to enroll in courses which will both motivate and have a direct correlation to professional goals.

Curriculum Requirements

Once accepted into the University and the art program, the B.F.A. student must complete curriculum requirements in order to matriculate and graduate. The B.F.A. curriculum includes required and elective art courses, art history courses, and University established academic (liberal arts) requirements. During the first two years the art student must complete a sequence of courses in drawing and visual foundation design for a total of 18 credit hours. Art electives are available in all major studio areas and are designed to provide the basic experience that will enable the student to select a major at the beginning of the third (Junior) year. Students must complete 12 credit hours of studio electives and 6 credit hours of Art Survey to complete the lower-division requirements of the art program (36 total hours).

B.F.A. Degree credit-hour minimum requirements are as follows:

Hr.	
72	Studio (12 credits must be in drawing and 30 credits in major area)
12	Art History
35	Liberal Arts (academics required by the University)
9	Elective (art history, studio or liberal arts)
128	Hours Total

B.F.A. Program

In order to complete the B.F.A. degree program in four years, a student must take from 15 to 18 credit hours per semester, or 30 to 36 credits per year.

A typical B.F.A. degree program which completes degree requirements in four years is as follows:

Freshman Year

Hr.	
6	Drawing
6	Visual Foundations (2- and 3-dimensional design)
6	Art History
14	Liberal Arts (including English)
2	General Physical Education
34	Hours Total

Sophomore Year
Hr.
6 Drawing
12 Studio (elected from three of the five major studio areas)
12 Liberal Arts

30 Hours Total

Junior Year
Hr.
21 Studio (including 9 hours in major area)
6 Art History
4 Liberal Arts
3 Elective

34 Hours Total

Senior Year
Hr.
21 Studio (including 15 semester credit hours in major area)
3 Liberal Arts
6 Elective

30 Hours Total

To enter the upper division, major area studio courses, the student must have completed the four-semester lower-division program which should include at least two semesters (6 semester credit hours) to introductory work from the area of intended major.

Lower Division: The two-year, lower-division required sequence of courses in drawing, visual foundations, art history, and introductory studio prepares the student for advanced study. Idea development, technical ability, and communication skills are taught with equal emphasis by involving the student in a wide range of problems.

The first year of lower-division instruction offers a broad experience in drawing, design, and art history. Emphasis is on basic skills and the development of a common vocabulary with which student objectives can be clearly defined. In the second year, students have the option of selecting introductory courses from three of the five major studio areas which are most suited to their particular interests. Advanced drawing is also required in the second year.

Lower-division art requirements are as follows:

Art 11—Drawing, 3 hr.
Art 12—Drawing, 3 hr.
Art 121—Visual Foundation, 3 hr.
Art 122—Visual Foundation, 3 hr.
Art 105—Survey of Art, 3 hr.
Art 106—Survey of Art, 3 hr.
Art 211—Drawing, 3 hr.
Art 212—Drawing, 3 hr.
Studio Introductory—12 hr.
Lower-Division Art Total: 36 Hours

Upper Division: The third-year of study marks the entry into the upper division. The student begins to concentrate in one area of major studio concern, and to direct and apply the basic skills acquired during the first two years of art instruction. Major areas offered by the Division of Art are ceramics, painting, printmaking, graphic design, and sculpture.

During the third and fourth years, the studio major accounts for a minimum of 24 semester credit hours or almost half the credit earned. The

remaining credit hours are taken in art history, studio electives, electives, and liberal arts.

Upper-division art requirements are as follows:

Art 200—Studio Major, 24 hr. (minimum)
Art 100/200—Studio electives, 18 hr.
Art 200—Art History, 6 hr.
Upper-Division Art Total: 48 Hours

B.F.A. Liberal Arts Requirements: Liberal arts requirements are defined by WVU. The undergraduate art student must successfully complete a minimum of 35 semester credit hours of liberal arts to qualify for graduation. To satisfy this requirement the following distribution of liberal arts credits must be achieved:

English 1 and 2—6 hr.
General Physical Education 1 and 2—2 hr.
Core A (Humanities)—3 hr.
Core B (Social Sciences)—12 hr.
Core C (Natural Sciences)—12 hr.
Liberal Arts Total: 35 Hours

B.F.A. with Certification Curriculum Requirements: Students wishing to be certified to teach K-12 in West Virginia must complete competency requirements established by the state in addition to Division of Art B.F.A. degree requirements.

B.F.A. degree with certification credit-hour minimum requirements are as follows:

69 Studio (12 credits must be in drawing and 30 credits in major studio area)
12 Art History
43 Liberal Arts
35 Art Education and Education (including student teaching)

159 Hours Total

B.F.A. with Certification Curriculum: This variation of the regular B.F.A. program begins after the completion of the freshman year and requires careful selection of both studio and academic courses. But to the additional liberal arts and education course requirement, 4½-5 years of school work should be anticipated.

B.F.A. with Certification Curriculum Liberal Arts and Education Requirements: Liberal arts requirements are designed by the state of West Virginia certifying agency and WVU. Education requirements are maintained by the state. Undergraduate art students desiring certification should consult with the Art Education adviser to be certain of compliance with certification criteria.

Bachelor of Art (B.A.) Art Education Curriculum

To qualify for teaching art in the public schools, elementary through secondary level, the student should complete the Art Education single comprehensive curriculum, Grades K-12. The program features a commitment to practical experience integrated with a strong studio involvement.

Curriculum Requirements

The B.A. student must complete the stated curricular requirements in order to matriculate and graduate. The B.A. curriculum includes required and elective studio art courses, required art history courses, and University

established academic (liberal arts) requirements, as well as those courses prescribed by the state to qualify for certification.

The first year of instruction is the same for all art majors—B.F.A. or B.A. Students must complete a sequence of courses in drawing, visual foundation design, and art survey. The second year of the B.A. program includes a number of studio art courses required as competencies required by the state, as well as necessary academic and education courses.

B.A. degree credit-hour minimum requirements are as follows:

45 Studio
6 Art History
43 Liberal Arts
35 Art Education and Education (including student teaching)

129 Hours Total

B.A. Program

To complete the B.A. degree program in four years, a student must take from 15 to 18 credit hours per semester, or 30 to 36 credits per year.

A typical B.A. degree program which completes degree requirements in four years is as follows:

Freshman Year
6 Drawing
6 Visual Foundation (2- and 3-dimensional design)
6 Art History
14 Liberal Arts (including English)
2 General Physical Education

34 Hours Total

Sophomore Year
21 Studio (including electives)
12 Liberal Arts
2 Education (C&I)

35 Hours Total

Junior Year
3 Drawing
3 Studio
6 Art Education
12 Liberal Arts
6 Education

30 Hours Total

Senior Year
6 Studio
3 Art Education
3 Liberal Arts
18 Education (including student teaching)

30 Hours Total

For the complete qualification requirements and certification information, students should contact the Art Education adviser in the Division of Art.

Other Programs

For information concerning undergraduate interdepartmental programs in Art History, Special Education (with an art emphasis), and Medieval and Renaissance Studies please contact the Division of Art office in the College of Creative Arts.

Advising

It is recommended that all art majors confer regularly with their adviser in order to maintain the correct distribution of course work and establish the necessary prerequisites for upper-division instruction. In general students will find it difficult to carry more than three studio art classes in one year.

Portfolio Review

The Division of Art reserves the privilege of requiring a portfolio review to determine a student's retention in a program or emphasis.

Audit, Credit by Examination, Pass/Fail, and Non-Art Major Courses

No studio courses are available on an audit or credit by examination basis. Students enrolled in the Division of Art may not take art classes on a Pass/Fail basis. Courses designated for non-art majors may not be substituted for art degree requirements unless approved in advance by the Chairperson of the Division of Art.

Student Work

Every effort is made to protect student work and property. Work displayed in the WVU Galleries is insured for the exhibition period. The Division of Art does not accept responsibility for damage or losses under other circumstances.

The Division of Art reserves the right to retain certain examples of student work for reproduction and exhibition purposes and to retain for its permanent collection any examples which it may select. Students will normally be reimbursed for the cost of materials only.

Art Supplies

Supplies for classroom presentations, demonstrations and common use must—for economy and availability—be purchased from a central source and fund. To expect every student to individually supply all the materials needed for high consumption courses of instruction would create a situation of excessive financial hardship for most and a complex logistical problem for all. To offset this burden, the Division of Art orders in advance the required supplies through the WVU Book Store at a bulk rate and requires each student enrolled in those studio classes in which materials are supplied to share the cost through one payment per semester. The instructors will provide a complete list of materials to be supplied.

Courses of Instruction in Art (Art)

3. *Materials and Procedures.* I, II, S. 3 hr. For elementary education majors. Designed to familiarize the student with two- and three-dimensional media, processes, and concepts.

11. *Drawing.* I, II. 3 hr. Fundamental principles of drawing.

12. *Drawing.* I, II. 3 hr. *(Complementary to Art 11.)* Fundamental principles of drawing.

30. *Appreciation of Visual Arts.* I, II, S. 3 hr. The study of outstanding works of the visual arts from times past to the present: (1) sources of the creative impulse, and (2) relationship of art to the civilization producing it.

100. *Directed Art Studies.* I, II, S. 1-3 hr. *(May be repeated for credit.)* PR: Consent. Studies in painting, sculpture, printmaking, graphic design, ceramics, drawing, art education, art history; includes independent study.

105. *Survey of Art.* I. 3 hr. History of visual art from prehistoric times to the Renaissance.

106. *Survey of Art.* II. 3 hr. History of visual art from the Renaissance to the present.

113. *Painting.* I, II. 3 hr. PR: Art 12, 121 or equiv. Basic concepts and techniques in watercolor and/or acrylic painting.

114. *Painting.* I, II. 3 hr. PR: Art 12, 121 or equiv. Basic concepts and techniques in oil painting.

121. *Visual Foundation.* I, II. 3 hr. Visual perception, composition, manipulation of materials, and exploration of two-dimensional formal elements.

122. *Visual Foundation.* I, II. 3 hr. *(Continuation of Art 121.)* Three-dimensional formal elements.

123. *Graphic Design.* I, II. 3 hr. PR: Art 12, 121 or equiv. An introduction to the tools, materials, and basic principles of graphic design with emphasis on form and color.

124. *Graphic Design.* I, II. 3 hr. PR: Art 123 or equiv. *(Complementary to Art 123, with particular emphasis on typographic solutions.)* An introduction.

126. *Sculpture.* I, II. 3 hr. PR: Art 12, 122 or equiv. An introduction to basic sculptural concepts using simple materials and techniques.

127. *Sculpture.* I, II. 3 hr. PR: Art 126 or equiv. Extension of Art 126, using more complex materials and printmaking.

130. *Printmaking.* I, II. 3 hr. PR: Art 12, 121 or equiv. Basic concepts and techniques of intaglio printmaking.

131. *Printmaking.* I, II. 3 hr. PR: Art 12, 121 or equiv. Basic concepts and techniques of lithographic printmaking.

140. *Ceramics.* I, II. 3 hr. PR: Art 12, 122 or equiv. Basic concepts, techniques, and media in ceramics.

141. *Ceramics.* I, II. 3 hr. PR: Art 12, 122 or equiv. *(Complementary to Art 140).* Fundamental concepts, techniques, and media.

165. *Art Education in the Elementary School.* I. 3 hr. PR: Art 12, 122 or equiv. The content and character of art education at the elementary level, emphasizing methods and techniques of instruction.

166. *Art Education in the Secondary School.* II. 3 hr. PR: Art 12, 122 or equiv. The content and character of art education at the secondary level, emphasizing methods and techniques of instruction.

200. *Directed Art Studies.* I, II, S. 1-15 hr. *(May be repeated for credit.)* PR: Consent. Studies in painting, sculpture, printmaking, graphic design, ceramics, drawing, art education, art history; includes independent study.

211. *Figure Drawing.* I, II, S. 3 hr. PR: Art 12, 121 or equiv. A course in compositional structure from the figure.

212. *Advanced Drawing.* I, II, S. 3 hr. *(May be repeated for credit.)* PR: Art 211 or equiv. Advanced tutorial drawing course.

Division of Music

The Division of Music is an accredited institutional member of the National Association of Schools of Music, the only nationally recognized accrediting agency for professional music instruction. All programs comply

with objectives and guidelines as required by this organization. The music education program is fully accredited by the National Council for Accreditation of Teacher Education.

The student interested in a career in music has a wide range of occupations from which to choose. Most fall into one of three basic categories: performing, composing or arranging, and teaching. To these ends, the Division of Music offers specialized programs in Performance (Applied Music), Theory-Composition, Music History-Theory, and Music Education, all of which lead to the degree of Bachelor of Music. Each of these curricula prepares the student for the added career option of private studio teaching in the principal performance area.

Students who complete a curriculum in Music Education will have satisfied course requirements to teach both vocal and instrumental music, as well as general music, in the elementary and secondary schools, grades K-12. With further study on the graduate level, students may qualify for teaching positions in a junior or community college, four-year college, or university. Others may aspire to a career in performance as a solo artist or as a member of an ensemble, or may compose or arrange music for performance.

Music graduates sometimes pursue interests in such areas as music librarianship, arts management, arts journalism/criticism, or in the music publishing and manufacturing industries, in consulting, editorial, sales, or management positions.

A music major can change from one music curriculum to another, particularly during the freshman or sophomore years, without great loss of course credit. Music majors are encouraged to explore and follow the curriculum for which they are best qualified and in which they can expect the greatest success. Evaluation of their work by the Division of Music faculty will aid these decisions.

Some students who wish a broader, liberal arts-oriented program may pursue the Bachelor of Arts (B.A.) degree. The B.A., with a major in Musical Arts—offered jointly with the College of Arts and Sciences—is described in the following material. In addition to the undergraduate program, courses leading to the following graduate degrees are offered: Master of Music, Doctor of Philosophy, and Doctor of Musical Arts. The Doctor of Education degree is offered in cooperation with the College of Human Resources and Education.

The 41-member faculty provides a rich background in professional performance and musical scholarship, along with a sincere interest in students. Students find these dedicated teachers to be both demanding and sympathetic.

Faculty performing groups include the Mountain State Brass Quintet, Baroque Ensemble, American Arts Trio, and the Amart String Quartet. The West Virginia Symphonette, a professional chamber orchestra, includes many faculty among its membership. Student performing groups, in addition to those listed below, include the Opera Theatre, Percussion Ensemble, Trombone Ensemble, and numerous small chamber ensembles.

Musical Organizations

After completing four semesters in one of the bands or the orchestra, especially qualified members of these organizations may continue service in them upon invitation and receive allowances in the form of remission of fees amounting to $30.00 per semester.

The *University Orchestras* are open, by audition, to all students and residents of the community who are proficient in the playing of an orchestra

instrument. The repertoire is that of the standard orchestra, with special emphasis on contemporary American music. (May be taken for credit.)

The *University Choir* is an ensemble of forty vocalists selected by audition. The group sings the standard choral repertoire and makes off-campus appearances during the year. (May be taken for credit.)

The *Collegium Musicum* is devoted to the performance of music for small vocal or instrumental ensembles, primarily early music. (May be taken for credit.)

The *University Choral Union* is open to all University students who can satisfactorily sing a part, by audition. This organization offers opportunity to participate in the performance of major choral works. (May be taken for credit.)

The *Wind Ensemble* is a select group of approximately forty wind and percussion players chosen by audition and performs music particularly appropriate to its size and special characteristics. (May be taken for credit.)

The *Symphonic Band* and *Concert Band* are open to all qualified WVU students by audition. They perform both traditional and contemporary band music. (May be taken for credit.)

The *Mountaineer Marching Band* of over 300 members is open to all qualified students in the University. Its activities are confined to the first semester, during which time it presents music and marching pageantry at football games and other special occasions. (May be taken for credit.)

The *Varsity Band* is open to all qualified WVU students. Activities are confined to the Spring semester; it performs at home basketball games and other special events, and functions as a concert band after the basketball season. (May be taken for credit.)

The *Jazz Ensembles* are stage bands which perform many original compositions, as well as those from the big band era and from the repertory of contemporary jazz bands. Membership is by audition. (May be taken for credit.)

Bachelor of Music Degree

Acceptance. After admission to the University but before being accepted as a music major, each student must demonstrate satisfactory previous musical preparation through an entrance audition. These conference-auditions are held in Morgantown throughout the school year, and in Charleston and other cities by special arrangement. A tape recording and other supporting material may be submitted when circumstances prevent a visit to Morgantown for this purpose. Dates of these auditions and details concerning them are available from the Division of Music.

The audition is a preliminary assessment of student potential for success in the program. The assessment will be confirmed or adjusted after the first semester of study.

In addition to fulfilling the special requirements indicated below for the appropriate curriculum, each student also must satisfy the following general requirements.

Proficiency Levels. Before graduation, each undergraduate student must satisfy a specified Proficiency Level appropriate to the curriculum in the student's principal performance area, in piano (if piano is not the major instrument), and in voice (in the case of instrumental music education majors). A listing of the Proficiency Levels for each area is available from the Division of Music. The listed repertoire (or works of comparable technical and musical difficulty) for each level is to be performed with musical understanding as well as technical mastery in order to satisfy the

requirement. Students who are admitted conditionally must make up deficiencies as soon as possible. Lack of reasonable progress will subject the student to probation. If, in the judgment of the faculty, it will be impossible for the student to complete graduation requirements in a reasonable length of time, the student's enrollment in the Division of Music will be terminated.

Keyboard Proficiency Examination. In addition to fulfilling the Proficiency Level requirement in piano indicated in the curriculum, each student is required to demonstrate proficiency in keyboard harmony by passing a special examination.

Recital and Concert Attendance. Each full-time undergraduate music major must maintain a satisfactory record of attendance at recitals and concerts presented at WVU during most semesters in residence.

Participation in Musical Organizations. Each music major must participate in musical organizations for the number of semesters indicated in the curriculum. Scholarship recipients may be called upon to render special service (as participants in particular organizations or ensembles, as piano accompanists, etc.), as designated by the division chairperson. All students are advised to purchase and bring to campus a portable (folding) music stand.

Completion of Degree Requirements. The student is responsible for correctly fulfilling all graduation requirements. Each student should review the curriculum requirements both before and after every registration period so that errors or omissions will be detected immediately. *Transfer students* must establish transfer credit from other institutions as early as possible in their WVU study—preferably during the first semester of residence. The degree of Bachelor of Music is conferred upon any student who complies with the general regulations of the University concerning degrees, satisfies departmental requirements, including expected Proficiency Levels, and completes an appropriate curriculum with a minimum overall grade-point average of 2.0 (C).

The sample curricular outlines which follow may vary as to actual distribution in individual semesters. The precise number of elective credits in a given semester, for example, may vary with the student's choice of courses. In curricula in which the course number Music 110 is listed twice, the student is expected to study both principal and secondary instruments.

Applied Music

The Applied Music curricula are especially designed for students wishing to prepare themselves as performers or as teachers of a particular instrument or voice. The increased interest of society today in the arts is creating many new opportunities for the professional musician and for the private music teacher.

A student in an Applied Music curriculum should enter as a freshman having achieved Grade Level 6 in the principal performance area, and must complete Grade Level 10 in that area to be eligible for graduation. In addition to presentation of a senior recital, Applied Music majors also must make three solo appearances on the major instrument in upper-level student recitals.

Applied Music majors are encouraged to participate in the division's major performing organizations (Music 100-105). A maximum of 8 hours of credit in these organizations will be counted toward requirements for graduation.

Theory electives may include Music 171, 172, 160, 260, 263, 264, 265, 267, 268.

APPLIED CURRICULUM—PIANO

At least 2 of the 8 semesters of required participation in musical organizations (Music 100-105) must be as a member of a choral group (Music 102 or 105). With the permission of the Coordinator of Keyboard Studies, up to 3 semesters of this requirement may be satisfied by enrollment in Music 115 (Chamber Music-Accompanying). A total of 19 hours of courses from Core groups B and C is required, with no less than 6 hours to be earned in either group. A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 61, 62	4	Music 63, 64	4
Music 100-105	1-2	Music 31	1
Engl. 1	3	Music 100-105	1-2
G.P.E. 1	1	G.P.E. 2	1
Core B or C	3	Core B or C	3
	16-17		17-18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 65, 66	4	Music 67, 68	4
Music 33	3	Music 34	3
Music 100-105	1-2	Music 100-105	1-2
Music 115	1	Music 115	1
Music elective	2	Music elective	2
Engl. 2	3	Elective	3
	18-19		18-19

THIRD YEAR

First Sem	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 100-105	1-2	Music 221-225	3
Music 115	1	Music 100-105	1-2
Music 118	1	Music 115	1
Theory elective	2	Music 119	2
Theory elective	3	Theory elective	2
Music elective	2	Music elective	2
Elective	3	Core B or C	3
	18-19		18-19

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 115	1	Music 115	1
Music 218	2	Music 219	2
Music 100-105	1-2	Music 299	2
Music elective	2	Music 100-105	1-2
Core B or C	6	Music elective	2
		Core B or C	4
	16-17		16-17

Minimum: 137 hr.

Applied Curriculum—Piano Pedagogy Emphasis

Admission only by approval of the piano faculty. Required for graduation: Proficiency Level 9; Senior recital; and 3 performances on Upper Level Recitals.

Candidates for the Applied Degree in Piano with Pedagogy Emphasis will follow the basic Applied Piano curriculum with the following changes:

1. In Second Year—Substitute 4 hours of Music 118-119 for the 4 hours of music elective.

2. In Third Year—Substitute 3 hours of Music 210 or 212 for the 2 hours of Music 118 and 2 hours of music elective during the first semester, and 3 hours of Music 151 for the 2 hours of Music 119 and 2 hours of music elective during the second semester. Requires 17-18 hours each semester.

3. In Fourth Year—Substitute 3 hours of Music 210 or 212 for 2 hours of music elective during the first semester and 2 hours of Major Project—Music 200—for the 2 hours of music elective during the second semester. Requires 17-18 hours the first semester and 16-17 hours in the second semester.

Applied Curriculum—Piano Jazz Emphasis

Admission only by approval of the piano faculty. (Limited to those students with experience and a demonstrated ability in the area of jazz improvisation.) Required for graduation: Proficiency Level 9; Senior recital (no more than one-half of program consisting of jazz); and 3 Upper Level Recital performances.

Candidates for the Applied Degree in Piano with Jazz Emphasis will follow the basic Applied Piano curriculum with the following change: Only 2 semesters of Music 100-105 required with the remaining 6 semesters of participation in musical organizations to be earned in non-piano sections of Music 115 which require a jazz pianist (Jazz Ensemble, Trombone Ensemble, Percussion Ensemble, etc.).

Applied Curriculum—Piano Coaching-Accompanying Emphasis

Admission only by approval of the piano faculty. Required for graduation: Proficiency Level 10; Senior Recital; coach and accompany under supervision; 2 full voice recitals, 1 string recital, 1 recital of another instrument (Clarinet, Flute, Oboe, Horn); coach, prepare musically and accompany in performance two scenes from standard-repertory operas in their original languages (scenes should involve a minimum of two people and be scenes with some dramatic development). No solo performances on Upper Level Recitals are required.

Candidates for the Applied Degree in Piano with Coaching-Accompanying emphasis will follow the basic Applied Piano curriculum with the following changes:

1. In Second Year—Substitute Music 218-219—Voice Repertoire, 4 hours, Music 113, 2 hours, and Music 19, 2 hours (1 hour each semester), for 7 hours elective. Requires 19-20 hours of first semester and 18-19 hours the second.
2. In Third Year—Substitute Music 113, 4 hours for the music elective; and add Music 19, 2 hours (1 hour each semester). Requires 19-20 hours each semester.
3. In Fourth Year—Substitute Music 113 for 2 hours of music elective and add Music 19; 2 hours (1 hour each semester). Requires 17-18 hours each semester.

APPLIED CURRICULUM—ORGAN

In addition to the required Proficiency Level 10 in organ, this curriculum also requires achievement of Proficiency Level 5 in piano before graduation. At least 6 of the 8 semesters of required participation in musical organizations (Music 100-105) must be as a member of a choral group (Music 102-105). A total of 19 credit hours earned from Core groups B and C is required, with no less than 6 credit hours earned in either group. A recommended distribution of the courses required in this curriculum:

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110-10	4	Music 110-10	4	Music 110-10	4	Music 110-10	4
Music 110-09	2	Music 110-09	2	Music 110-09	2	Music 110-09	2
Music 61, 62	4	Music 63, 64	4	Music 65, 66	4	Music 67, 68	4
Music 100-105	1-2	Music 31	1	Music 33	3	Music 34	3
Engl. 1	3	Music 100-105	1-2	Music 100-105	1-2	Music 100-105	1-2
G.P.E. 1	1	G.P.E. 2	1	Engl. 2	3	Elective	3
Core B or C	3	Core B or C	4				
	18-19		17-18		17-18		17-18

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110-10	4	Music 110	4	Music 110-10	4	Music 110-10	4
Music 51	1	Music 221-225	3	Music 100-105	1	Music 100-105	1-2
Theory elective	2	Theory elective	2	Music 218	1	Music 219	1
Music 118	1	Theory elective	3	Core B or C	3	Music 299	2
Music 100-105	1-2	Music 119	1	Music elective	3	Music elective	4
Music elective	3	Music 100-105	1-2	Core A	3	Core B or C	3
Core B or C	6	Music elective	3	Elective	3		
	18-19		17-18		18-19		15-16

Minimum: 137 hr.

APPLIED CURRICULUM—BAND OR ORCHESTRA INSTRUMENT
Flute, Oboe, Clarinet, Saxophone, Bassoon, Horn, Trumpet, Trombone, Euphonium, Tuba, Percussion, Violin, Viola, 'Cello, and Double Bass

In addition to the required Proficiency Level 10 on the major instrument, this curriculum also requires achievement of Proficiency Level 3 in piano before graduation. A total of 19 credit hours of courses from Core groups B and C is required, with no less than 6 credit hours earned in either group. A recommended distribution of the courses required in this curriculum:

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4	Music 110	4	Music 110	4
Class Piano	1	Class Piano	1	Class Piano	1	Class Piano	1
Music 61, 62	4	Music 63, 64	4	Music 65, 66	4	Music 67, 68	4
Music 100 or 103	1-2	Music 100 or 103	1-2	Music 33	3	Music 34	3
Engl. 1	3	Core B or C	3	Music 100 or 103	1-2	Music 100 or 103	1-2
G.P.E. 1	1	G.P.E. 2	1	Engl. 2	3	Elective	3
Core B or C	3	Music 31	1				
	17-18		15-16		16-17		16-17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4	Music 110	4	Music 110	4
Class Piano	2	Class Piano	2	Music 221-225	3	Music 299	2
Music 171	2	Music 172	2	Music 115	1	Music 115	1
Music 118	1	Music 119	1	Music 100 or 103	1-2	Music 100 or 103	1-2
Music 115	1	Music 115	1	Music elective	2	Music elective	2
Music 100 or 103	1-2	Music 100 or 103	1-2	Core B or C	6	Core B or C	4
Theory elective	2	Theory elective	2				
Core B or C	6	Theory elective	3				
Elective	3	Core A	3				
	19-20		19-20		17-18		14-15

Minimum: 133 hr.

APPLIED CURRICULUM—WOODWINDS

Applied music majors whose major instrument is in the woodwind family and who show strong performance ability on another woodwind instrument may qualify for the Applied Curriculum in Woodwinds. Approval for admission to this curriculum will not be given by the woodwind faculty until

after the first year of study at which time the student must achieve an appropriate level on three of the five woodwind instruments. In addition to the senior recital (which may be given on more than one instrument), the student in this curriculum must present three solo or upper-level student recital performances, one on each of the three major instruments. Proficiency Level requirements for this curriculum are:

A primary major woodwind instrument: Proficiency Level 9.

Two secondary major woodwind instruments: Proficiency Level 7.

Two minor woodwind instruments: Proficiency Level 4.

Piano: Proficiency Level 2.

The recommended distribution of the required courses is the same as in the *Applied Curriculum—Band or Orchestra Instrument*, with the following changes:

1. Substitution of 2 hours in Music 110 and 2 hours in Music 115 for the 3 hours of electives during the second year.
2. Substitution of 4 hours in Music 110 for the 3 hours of electives in the third year.
3. Substitution of 4 hours in Music 110 for the 4 hours of music electives in the fourth year. Total minimum credits for the curriculum: 135.

APPLIED CURRICULUM—VOICE

In addition to the required Proficiency Level 10 in voice, a student completing this currciulum must also achieve Proficiency Level 3 in piano before graduation. One year of either Italian, French, or German is required, as is one course from each Core group (A, B, and C). A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110-18	4
Class Piano	1	Class Piano	1
Music 61, 62	4	Music 31	1
Music 113	2	Music 63, 64	4
Music 102 or 105	1-2	Music 113	2
Engl. 1	3	Music 102 or 105	1-2
G.P.E. 1	1	Core B or C	3
		G.P.E. 2	1
	16-17		17-18

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110-18	4	Music 110-18	4
Class Piano	1	Class Piano	1
Music 65, 66	4	Music 67, 68	4
Music 33	3	Music 34	3
Music 113	2	Music 113	2
Music 102 or 105	1-2	Music 102 or 105	1-2
Engl. 2	3		
	18-19		15-16

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Class Piano	2	Class Piano	2
Music 19	2	Music 19	2
Theory elective	2	Music 102 or 105	1
Music 102 or 105	1-2	Theory elective	2
Foreign Lang.	3	Foreign Lang.	3
Core B or C	3	Theory elective	3
	17-18		17-18

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 118	1	Music 119	1
Music 19	2	Music 19	2
Music 218	2	Music 219	2
Music 221-225	3	Music 299	2
Music 102 or 105	1-2	Music 102 or 105	1-2
Music elective	3	Music elective	2
		Core A	3
	16-17		17-18

Minimum: 133 hr.

Theory-Composition, Music History-Theory

The Theory-Composition Curriculum concentrates on developing skills in musical analysis, composition, and arranging. Students pursuing the Music History-Theory Curriculum find more emphasis on history and less on musical composition.

Students in these curricula will satisfy the 8 semester requirement for participation in a performing organization through registration in Music 100-105, 115, or 239 (Band, Orchestra, Choral Union, University Choir, Chamber Music, or Collegium Musicum), with at least 4 hours being earned in a major performing group (Music 100-105). Majors in these curricula must present two solo performances on the major instrument in Upper Level Recitals before graduation.

THEORY-COMPOSITION CURRICULUM

An average of at least B in the required freshman and sophomore theory courses (Music 61-68) or the consent of the Coordinator of Theory-Composition is required for continuation in this curriculum. A theory-composition major should enter as a freshman having achieved Proficiency Level 4 on the student's major instrument, and must complete Proficiency Level 8 on that instrument before graduation. If piano is not the major instrument, Proficiency Level 4 in this instrument also must be established. A total of 16 hours of courses from Core groups B and C is required, with no less than 6 hours earned in either group. Another language may be substituted for the indicated French, German, or Italian with the approval of the Coordinator of Theory-Composition. The Major Project (Music 266) must be in theory or composition. A recommended distribution of the required courses in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 51	1	Music 63, 64	4
Music 61, 62	4	Music 31	1
Music 100-105, or 115	1-2	Music 52	2
Engl. 1	3	Music 100-105, or 115	1-2
G.P.E. 1	1	Core B or C	6
Core B or C	3		
	17-18		18-19

SECOND YEAR

First Sem.	*Hr.*	*Second Sem*	*Hr.*
Music 110	2	Music 110	2
Music 65, 66	4	Music elective	2
Music 33	3	Music 67, 68	4
Music 160	2	Music 34	3
Music 100-105, or 115	1-2	Music 160	2
French, German, or Italian 1	3	Music 100-105, or 115	1-2
Engl. 2	3	French, German, or Italian 2	3
		G.P.E. 2	1
	18-19		18-19

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Music elective	2	Music elective	2
Music 171	2	Music 172	2
Music 263	2	Music 264	2
Music 260	2	Music 260	2
Music 267	2	Music 268	2
Music 100-105, 115, or 239	1-2	Music 100-105, 115, or 239	1-2
French, German, or Italian 3	3	French, German, or Italian 4	3
	16-17		16-17

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Music elective	2	Music 265	3
Music 260	2	Music 266	2
Music 225	3	Music 211-224	3
Music 100-105, 115, or 239	1	Music 100-105, 115, or 239	1-2
Core B or C	3	Core B or C	4
	15-16		15-16

Minimum: 133 hr.

MUSIC HISTORY-THEORY CURRICULUM

A maximum of 16 hours of applied music credit (Music 110) will be counted toward the required Proficiency Level 7 on the major instrument. If the student's major instrument is not Piano, up to 12 of the elective credit hours may be used to achieve the required Proficiency Level 4 in that instrument. A student wishing to take more than 6 of the elective credit hours in non-music courses or to substitute a foreign language other than French, German, or Latin may do so only with the consent of the Coordinator of Music History and Literature. The Major Project (Music 266) must be in music history or theory. A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Elective	1	Elective	1
Music 61, 62	4	Music 63, 64	4
Music 100-105, or 115	1-2	Music 100-105, or 115	1-2
Engl. 1	3	G.P.E. 2	1
G.P.E. 1	1	Core B	6
Core B	3	Music 31	1
	17-18		18-19

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Elective	2	Elective	1
Music 65, 66	4	Music 67, 68	4
Music 33	3	Music 34	3
Music 100-105, or 115	1-2	Music 100-105, or 115	1-2
French, German, or Latin 1	3	French, German, or Latin 2	3
Engl. 2	3	Core B	3
	17-18		17-18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Elective	2	Elective	2
Music 171	2	Music 172	2
Music 263	2	Music 264	2
Music 221-224	3	Music 221-224	3
Music 100-105, 115, or 239	1-2	Music 100-105, 115, or 239	1-2
French, German, or Latin 3	3	French, German, or Latin 4	3
Core C	4	Music 265	3
	19-20		18-19

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Elective	2	Elective	2
Music 160	2	Music 160	2
Music 225	3	Music 266	2
Music 100-105, 115, or 239	1-2	Music 100-105 115, or 239	1-2
Lit. (English or Foreign)	3	Literature or Art Appreciation	3
Core C	4	Core C	4
	15-16		14-15

Minimum: 135 hr.

Music Education

Students successfully completing a Music Education curriculum will have satisfied course requirements for the Professional Certificate, Grades K-12, and will be eligible for certification to teach instrumental, vocal, and general music in the public schools of West Virginia.

In order to qualify for student teaching, a student must have a 2.25 grade-point average in all work attempted, a 2.0 average in Education courses (C&I 7; Ed. P. 105, 106) and a 2.0 average in music education methods courses (M. 151, 152). Students may be called upon to do their student teaching during either semester of the fourth year, and it may be necessary for student teaching to be done outside Monongalia County. Students should plan to provide their own transportation during the student teaching semester.

A student following either Music Education curriculum should enter as a freshman having achieved Proficiency Level 3 on the student's major instrument, and must complete Proficiency Level 7 on that instrument to be eligible for graduation. The student also must present two solo performances on the major instrument in student recitals before graduation.

The Core requirements must contain the following:

(a) 9 hours in Core A, including Art 30 or Theatre 30; 3 hours of literature (in English or in another language); and 3 hours in one of the following: religious studies, philosophy, humanities, English composition, linguistics, or foreign language.

(b) 12 hours in Core B, including at least one course in history, and one course in one of the following: sociology, social science, anthropology, or multidisciplinary areas.

(c) 12 hours in Core C, including at least one course in science (Phys. 7—Physics of Music—is recommended) and one course in mathematics.

MUSIC EDUCATION CURRICULUM—VOCAL OR GENERAL MUSIC EMPHASIS

Students wishing to emphasize preparation in choral music or in general music should choose this curriculum. Those whose major performance area is not voice must complete Proficiency Level 3 in voice; those whose major instrument is not piano must complete Proficiency Level 3 in piano. A recommended distribution of the required courses in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Class Piano	1	Class Piano	1
Music 61, 62	4	Music 63, 64	4
Music 102, 105	1-2	Music 102, 105	1-2
Engl. 1	3	Music 31	1
G.P.E. 1	1	Core	6
Core	3	G.P.E. 2	1
	17-18		18-19

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Class Piano	1	Class Piano	1
Music 33	3	Music 34	3
Music 65, 66	4	Music 67, 68	4
Music 51	1	Music 52	2
Music 102, 105	1-2	Music 102, 105	1-2
Engl. 2	3	Core	3
		Music 49	2
	15-16		18-19

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 53	3
Music 151	3	Music 152	3
C&I 7	2	Ed. P. 105	3
Ed. P. 103	3	Core	6
Core	6		
	16		15

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 248	2	C&I 104	4
Music 48	3	C&I 187	6
Art 30	3	C&I 188	6
Hl. Ed. 102	2		
Core	6		
	16		16

Minimum: 131 hr.

MUSIC EDUCATION CURRICULUM—INSTRUMENTAL EMPHASIS

Students wishing to emphasize preparation in instrumental music (band or orchestra) should choose this curriculum. The 16 hours of applied music (Music 110) in this curriculum are to be used to achieve the following Proficiency Levels: major instrument, Level 7; voice, Level 1B; piano, Level 2. Those whose major performance area is a keyboard instrument or voice must complete Proficiency Level 4 on a band or orchestra instrument. One semester of Marching Band and four semesters of a major concert ensemble are

required for all wind and percussion players in the curriculum. String players are expected to complete five semesters of orchestra. A recommended distribution of the courses required in this curriculum:

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	4	Music 110	4
Music 110 (piano)	1	Music 110 (piano)	1
Music 100 or 103	1-2	Music 100 or 103	1-2
Music 61, 62	4	Music 63, 64	4
Engl. 1	3	Music 31	1
G.P.E. 1	1	G.P.E. 2	1
Core	3	Core	3
	17-18		18-19

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 110	2	Music 110	2
Music 110 (voice)	2	Music 100 or 103	1-2
Music 100 or 103	1-2	Music 34	3
Music 33	3	Music 67, 68	4
Music 65, 66	4	Music 52	2
Music 51	1	Music 44-47	2
Music 44-47	2	Core	3
Engl. 2	3		
	18-19		17-18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 100 or 103	1-2	Music 152	3
Music 151	3	Music 44-47	2
Music 53	3	Ed. P. 105	3
Music 44-47	2	Core	6
Ed. P. 103	3	C&I 7	2
Core	3		
	15-16		16

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Music 115	1	C&I 104	4
Music 248	2	C&I 187	6
Hl. Ed. 102	2	C&I 188	6
Art 30	3		
Core	9		
	17		16

Minimum: 134 hr.

Accelerated Curriculums

Students wishing to complete any music curriculum in less than four years may, with the approval of the adviser and the division chairperson, accelerate their program by attending summer sessions. All requirements of the four-year curriculum must be satisfied.

Combined Applied-Music Education Curriculum

An optional program can be arranged for outstanding students who desire to meet the requirements of majors in both Applied Music and Music Education. Admission to this rigorous program is by written consent of the Coordinator of the appropriate applied music area and the Coordinator of Music Education after the student has completed two semesters. This curriculum satisfies the course requirements of the Professional Certificate, Grades K-12.

The numerous possible combinations of Applied Music with Music Education cannot be listed separately here. When the student becomes a candidate for this degree, the student's adviser designates the specific courses which must be taken to satisfy the requirements for both Applied Music and Music Education. By attending summer sessions, it may be possible to complete the combined curriculum in four years.

Bachelor of Arts Degree

The Bachelor of Arts program in Musical Arts, an interdepartmental curriculum offered by the College of Arts and Sciences and the College of Creative Arts, provides an option for the student with an interest in music

who wishes to pursue a broader liberal arts education, rather than to seek a career as a performer or teacher.

Students wishing to enter this program must have the approval of the program adviser, and must meet audition requirements in the principal performance area, which can be on piano, organ, voice, or band or orchestra instrument.

The flexibility implicit in this program precludes publishing a recommended eight-semester course distribution. Unless otherwise specified, general College of Arts and Sciences and University regulations apply. Three principal areas of course work are required, as shown in the following outline:

A. *General Education*	*Hr.*
English 1, 2	6
Core A, B, C	36
Foreign Language	12
General Physical Education	2
Non-Music Electives	14-26
	Minimum—70
	Maximum—82

No music courses may be included in Core A.

Of the Core requirement and non-music electives, at least 24 credit hours must be in Arts and Sciences.

Foreign Language study is in addition to the Core requirement.

International Studies or Minority Studies: Each student must meet this requirement of the College of Arts and Sciences.

Depending upon individual interest, students may select courses from areas which could provide a basis for careers in music librarianship (courses in library science), computer science, music merchandising/arts management (courses in psychology, management, marketing) or music criticism (courses in English, journalism).

B. *Musicianship*	*Hr.*
Theory (Music 61-68)	16
Literature (Music 31, 33, 34)	7
Upper-Level Music Electives	3-9
	26-32

Upper-level music electives may include either Music 130, *Music of Appalachia*, or Music 230, *Music of Africa*, which satisfies the International Studies or Minority Studies requirement.

C. *Musical Performance*	*Hr.*
Applied Music (Music 110, major performance area)	16
Concert Organization (Music 100-105) or Ensemble (Music 115)	4
Performance Electives	0-6
	20-26

Student must attain Proficiency Level 7 in the major performance area. Piano proficiency is not required.

Two appearances in upper-level recitals and two semesters of recital attendance are required.

A student who is not making satisfactory progress in achieving the applied music proficiency level will be discontinued.

SUMMARY	*Hr.*
General Education	70-82
Musicianship	26-32
Musical Performance	20-26
Total	Minimum—128

No more than 42 credits in music courses (exclusive of Applied Music 110) may be counted toward graduation.

At least 30 credits overall must be at the 100-level or above.

A grade-point average of 2.0 is required for graduation.

Courses of Instruction in Music (Music)

19. *Introduction to Opera Theatre.* I, II. 0-4 hr. *(May be repeated for credit; max. 16 hr.)* PR: Consent. Practical work in all aspects of lyric theatre production. Development of lyric theatre stage technique through movement studies, performance in major and minor roles and operatic scenes, and advanced production techniques

30. *Introduction to Music.* I, II. 3 hr. *(Not open to music majors.)* Introductory course designed to develop an appreciation and understanding of the significance of music as a fine art, and to help the student develop intelligent listening habits.

31. *Introduction to Music Listening.* II. 1 hr. *(For music majors only.)* Guided listening to important works from all historical periods with emphasis upon the development of awareness of stylistic traits, such as harmonic idiom, melodic structure, tonal movement, texture, rhythm, etc.

33. *Music Literature 1.* I. 3 hr. PR: Music 31 or consent. Survey of music literature from the pre-Christian era through the Baroque.

34. *Music Literature 2.* II. 3 hr. PR: Music 31 or consent. Survey of music literature from Classicism through the twentieth century.

41. *Fundamental Music Skills.* I, II. 2 hr. *(Not open to music majors.)* Development of piano and autoharp skills for future classroom teachers. Basic understanding of rhythm, melody, harmony, and form.

42. *Teaching Elementary School Music.* I, II. 2 hr. PR: Music 41 or consent. *(Not open to music majors.)* Leading and teaching of songs. Guiding children in conceptual development in music through activities approach.

44. *Woodwind Instrument Pedagogy.* I, II. 2 hr. Techniques of teaching woodwind instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

45. *Brass Instrument Pedagogy.* I, II. 2 hr. Techniques of teaching brass instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

46. *String Instrument Pedagogy.* I, II. 2 hr. Techniques of teaching string instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

47. *Percussion Instrument Pedagogy.* I, II. 2 hr. Techniques of teaching percussion instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

48. *Instrumental Pedagogy.* I. 3 hr. *(For vocal emphasis majors only.)* Techniques of teaching band and orchestra instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

49. *Vocal Pedagogy.* II. 2 hr. PR: Two semesters of voice study. Techniques of voice culture; applicable to school choral activities and instruction of young singers.

51. *Fundamentals of Conducting.* I. 1 hr. PR: Sophomore standing. Basic conducting skills, including beat patterns, expressive gestures, cues, and the fermata; terminology; application of tempo markings.

52. *Conducting and Score Interpretation.* II. 2 hr. PR: Music 51 or consent. Mechanics of choral, orchestral, and band scores; score memorization. Application of skills to the conducting of choral groups.

53. *Conducting and Rehearsing.* I, II. 3 hr. PR: Music 52 or consent. Intensive study of scores within the student's specialization (band, orchestra, or chorus). Analysis of conducting problems; rehearsal techniques.

61. *Aural Theory.* I. 2 hr. The four aural theory courses (Music 61, 63, 65, and 67) form a unit of instruction devoted to the development of aural skills such as sight-singing, melodic and harmonic dictation, identification of chords, chord progressions, modulations, and non-harmonic tones.

62. *Written Theory.* I. 2 hr. Elementary theory (scales, keys, intervals) and introduction to diatonic harmony (part-writing and analysis).

63. *Aural Theory.* II. 2 hr. PR: Music 61. Continuation of Music 61.

64. *Written Theory.* II. 2 hr. PR: Music 62. Continuation of Music 62. Diatonic harmony including part-writing, harmonization of melodies, and harmonic analysis with triads, seventh chords, and secondary dominants.

65. *Aural Theory.* I. 2 hr. PR: Music 63. Continuation of Music 63.

66. *Written Theory.* I. 2 hr. PR: Music 64. Continuation of Music 64. Diatonic and chromatic harmony including part-writing, harmonization of melodies, and harmonic analysis with seventh chords, modulations, and foreign chords.

67. *Aural Theory.* II. 2 hr. PR: Music 65. Continuation of Music 65.

68. *Analysis of Music.* II. 2 hr. PR: Music 66. Consideration of melody, rhythm, harmony, texture, form, etc., and how they function to produce an organic work of art.

100. *Band.* I, II. 0-2 hr. *(May be repeated for credit.)* Wind Ensemble, Symphonic Band, Concert Band, Marching Band, Varsity Band.

102. *University Choral Union.* I, II. 0-1 hr. *(May be repeated for credit.)*

103. *Orchestra.* I, II. 0-2 hr. *(May be repeated for credit.)* University-Community Symphony Orchestra, Concert Orchestra, Opera Orchestra.

105. *University Choir.* I, II. 0-2 hr. *(May be repeated for credit.)*

110. *Applied Music.* I, II. 1-4 hr. *(May be repeated for credit.)* Open to qualified students in any field. An audition for placement may be required. Credit given as follows:
1. For music majors, 2 hr. credit for each 30-minute weekly lesson.
2. For others, a maximum of one 30-minute lesson per week for 2 hr. credit.
3. Students in lower grade levels of Applied Music may be grouped in small classes for initial instruction. 1-2 hr. credit.

113. *Diction for Singers.* I, II. 2 hr. *(May be repeated for credit; max. 8 hr.)* PR: Consent. Phonetics, phonetic symbols, and pronunciation in singing in alternating semesters in English, Italian; Latin, Spanish; German; and French. Other aspects of language that will aid in comprehension of song, oratorio, and operatic texts considered.

115. *Chamber Music.* I, II. 0-1 hr. *(May be repeated for credit.)* PR: Consent. Opportunity to perform in small ensembles, including Jazz, Percussion, Woodwind, Brass, Trombone, String, Piano, and New Music.

118. *Methods and Pedagogy.* I. 1-2 hr. PR: Music 110.

119. *Methods and Pedagogy.* II. 1-2 hr. PR: Music 118.

129. *Folk Music of the United States.* I. (Alternate Years.) 3 hr. Introduction to the folk music of various American cultural groups in historical context. Comparative analysis of representative tunes and texts.

130. *Music in Appalachia.* I. (Alternate Years.) 3 hr. *(Not open to music majors.)* Survey of traditional instrumental and vocal music of southern Appalachia. History, style characteristics, and performance techniques involving live and recorded examples emphasizing those found in West Virginia. *(Course will not be offered in 1983-84.)*

135. *Music in Western Culture.* I. 3 hr. PR: Music 30 or consent. *(Not open to music majors.)* A survey of western music from early Christian times to the twentieth century with special emphasis upon cultural and social relationships. *(Course will not be offered in 1983-84.)*

136. *Music of the Modern Age.* II. 3 hr. PR: Music 30 or consent. *(Not open to music majors.)* A survey of western music of the twentieth century from Debussy to recent years, emphasizing stylistic, historical, and cultural facets. *(Course will not be offered in 1983-84.)*

137. *Great Composers.* I. 3 hr. PR: Music 30 or consent. *(Not open to music majors.)* A study of major works by a chosen composer or group of composers.

138. *Introduction to History of Jazz.* II. 3 hr. PR: Music 30 or consent. An introduction to jazz, its characteristics, important performers, and their music, including an historical survey with attention to the changing style of the music.

151. *Music Education.* I. 3 hr. PR: Music 51. Methods, materials, and administration of K-12 music programs, focusing on the student's specialization. Sequential, conceptual, and skill development; emphasis on aural and reading competencies in music. Weekly laboratory arranged.

152. *Music Education.* II. 3 hr. PR: Music 151. Continuation of Music 151. Emphasis on teaching areas outside the student's specialization. Weekly laboratory arranged.

160. *Composition.* I, II. 2 hr. PR: Music 68 or consent. *(May be repeated for credit; max. 8 hr.)* Creative writing.

171. *Instrumentation.* I. 2 hr. PR: Music 64. Study of characteristics of band and orchestral instruments and their use in scoring.

172. *Orchestration and Band Arranging.* II. 2 hr. PR: Music 171. Problems in scoring for orchestra ensembles and band.

200. *Directed Music Studies.* I, II, S. 1-4 hr. *(May be repeated for credit.)* PR: Consent. Studies in applied music history, composition; includes directed or independent study in special topics.

210. *Piano Class Methods and Materials.* I. 3 hr. Methods, materials, and pedagogical techniques, including presentation of keyboard theory as used in functional piano. Practical organization of piano classes. Laboratory: Observation of experienced class teacher and student teaching.

212. *History of Keyboard Pedagogy and Technic.* II. 3 hr. Study of keyboard development and technique, including pedagogical works of the eighteenth through twentieth centuries and application to specific teaching problems. Laboratory: Student teaching and observation, emphasizing analysis and solution of technical problems. *(Course will not be offered in 1983-84.)*

213. *Introduction to Jazz Improvisation.* I, II. 2 hr. PR: Music 63, 64 and Proficiency Level 4. Development of improvisatory skills in the jazz idiom using melodic, harmonic, and rhythmic motives and patterns, and the application of knowledge of tonal centers, chord progressions, and junctions.

218. *Repertoire.* I. 0-2 hr.

219. *Repertoire.* II. 0-2 hr.

221. *Music Before 1500.* I, II, or S. 3 hr. PR: Music 33-34 or consent. A study of sacred and secular monophony, Notre Dame organa, thirteenth-century motet and conductus, and fourteenth and fifteenth-century polyphony in France and Italy. *(Course will be offered in Fall, 1983-84; Summer II, 1984-85; Spring, 1986-87.)*

222. *Music of the Sixteenth and Seventeenth Centuries.* I, II, or S. 3 hr. PR: Music 33-34 or consent. A study of styles and forms from the High Renaissance to the late Baroque. *(Course will be offered in Spring, 1983-84; Fall, 1985-86; Summer II, 1986-87.)*

223. *Music of the Eighteenth Century.* I, II, or S. 3 hr. PR: Music 33-34 or consent. A study of styles and forms of the Late Baroque through the Classic period. *(Course will be offered in Summer II, 1983-84; Spring, 1985-86.)*

224. *Music of the Nineteenth Century.* I, II, or S. 3 hr. PR: Music 33-34 or consent. A study of styles, forms, and theoretical concepts illustrative of nineteenth-century music. *(Course will be offered in Fall, 1984-85; Summer II, 1985.)*

225. *Music of the Twentieth Century.* I, II, or S. 3 hr. PR: Music 33-34 or consent. A study of stylistic trends during the twentieth century. *(Course will be offered in Spring, 1984-85; Fall, 1987-88.)*

230. *Music of Africa.* II. 3 hr. Traditional music of selected areas of Africa south of the Sahara with particular reference to East Africa. The diverse musical cultures with emphasis on historical background, instruments, ensembles, forms, styles, and music in its social context.

239. *Collegium Musicum.* I, II. 1-2 hr. *(May be repeated for credit.)* PR: Consent. Study of outstanding musical works not in the standard repertory. Performance of vocal and instrumental music, investigation of performance practices, preparation of editions, and direction of rehearsals under supervision.

240. *Clinic Chorus, Band, and Orchestra.* I, II. 1 hr. Experience in selection, preparation, and class performance of music appropriate for high school choral and instrumental groups. *(Course will not be offered in 1983-84.)*

243. *Music Workshops.* I, II, S. 1-2 hr. *(May be repeated for credit.)*

245. *Marching Band Techniques.* I. 2 hr. PR: One semester college marching band experience or consent. Study and practical application of techniques of planning and preparation of school marching band performances.

248. *Music Arranging for Public School Groups.* I, II. 2 hr. PR: Music 66. Practical experience in techniques of making simple, workable arrangements of music for public school choral and instrumental performance groups.

260. *Upper-Division Composition.* I, II. 2 hr. *(May be repeated for credit.)* PR: Two semesters Music 160, or consent based on scores submitted. Creative writing with emphasis on practical composition for performance.

263. *Counterpoint.* I. 2 hr. PR: Music 68 or consent. Sixteenth century counterpoint.

264. *Counterpoint.* II. 2 hr. PR: Music 68 or consent. Eighteenth century counterpoint.

265. *Analysis of Musical Form.* II. 3 hr. PR: Music 68 or consent. Detailed study of the structure of music.

267. *Electronic Music.* I. 2 hr. PR: Music 68 and consent. Technology of producing electronic music. Methods of producing electronic compositions, relationship between sound signal and sound perceived, ear training, analysis of examples from electronic music literature, and composition of electronic music.

268. *Electronic Music.* II. 2 hr. PR: Music 267. Continuation of Music 267.

299. *Recital.* I, II. 0-2 hr. *(Not available for Graduate credit.)* To be used to fulfill the applied major graduation requirement only when the student has achieved Proficiency Level 9. Students who have reached Level 6 may receive 1 hour credit, which may not be used to fulfill the graduation recital requirement.

310. *Secondary Applied Music.* I, II, S. 1 hr. *(May be repeated for credit.)* Group or individual instruction on a minor instrument (or voice), with emphasis on methods and materials for school music teachers.

312. *Keyboard Performance and Pedagogy.* I, II. 1-3 hr. *(May be repeated for credit.)* (Offered in 1-credit modules of which students may take one or more each semester.) Pedagogy, repertoire, interpretation, and other topics which will enhance preparation of private piano teachers.

335. *Survey of Vocal Music.* I. 3 hr. PR: 6 hr. upper-division music history. Survey of masses, oratorios, cantatas and operas from late Renaissance to the twentieth century. Solo repertoire will not be included. *(Course will not be offered in 1983-84.)*

336. *Survey of Instrumental Music.* II. 3 hr. PR: 6 hr. upper-division music history. Survey of instrumental ensemble music, concertos, symphonies, and other orchestral music from late Renaissance to the twentieth century. Solo repertoire will not be included. *(Course will not be offered in 1983-84.)*

341. *Music in the Elementary School.* II. 3 hr. PR: Music 30, 41, 42, or equiv. *(Not open to music majors.)* Development of skills, procedures, techniques, and materials used by the general classroom teacher of music in grades K-8. *(Course will not be offered in 1983-84.)*

342. *Teaching of Music Appreciation.* I. 3 hr. PR: Music 30, 41, 42, or equiv. *(Not open to music majors.)* Review of information, materials, sources, and techniques involved in teaching appreciation of music in public schools. *(Course will not be offered in 1983-84.)*

343. *Contemporary Techniques in Classroom Music.* I. 3 hr. PR: Music 152 or consent. Principles and practice of contemporary techniques in elementary and junior high school classroom music, including those of Orff and Kodaly.

344. *Appalachian Music for the Classroom.* II. 3 hr. Lecture, demonstration, and practical experience of Appalachian vocal and instrumental music, and in use of this music in public school classrooms. May involve field trips and construction of inexpensive instruments.

346. *Musicmaking in Middleschool/Junior High.* II, S. 3 hr. PR: Music 151, 152, equiv., or consent. Identification and sequencing of appropriate concepts and skills for general music class students. Selection and use of materials including popular music. Emphasis on student music-making activities. Evaluation procedures included.

Division of Theatre

The Division of Theatre offers an intense training program in theatre for the student who seeks artistic growth and development. The four-year course of study, leading to the Bachelor of Fine Arts (B.F.A.) degree, is designed for those students who intend to pursue a professional theatre career, as well as those who may enter other fields where theatre skills are desirable.

The various curriculums combine formal classes in theory with practical application and experience in the Division's theatre, studio, and shop areas. Public performances offer the student numerous opportunities to develop personal performance skill. Productions cover a wide range of world theatre, including new scripts, classical and modern works, and children's and puppet plays.

The theatre major may choose from among several different areas of emphasis, each of which provides a well-rounded knowledge of the art as well as an opportunity to specialize. Graduates of the division are employed in the professional theatre, radio, television, and film; some have chosen careers in fashion design, commercial sales work, make-up, lighting design, and other areas in which threatre skills provide a unique advantage.

Performances. The division annually produces eight major productions and numerous laboratory performances in its three principal performance areas: the Concert Theatre, Studio Theatre, and Classroom Theatre. These productions provide practical experience for theatre students and serve as a cultural outlet for the community. These productions span a wide range of performance styles. In addition, the division participates in a rural West Virginia touring theatre program.

Children's Theatre. A children's theatre production is presented each year for area school children. Productions on a smaller scale are performed throughout the year.

Puppet Mobile. Theatre majors, under the direction of a faculty member, operate a complete puppet theatre program. The division's Puppet Mobile tours the state from September through April.

Bachelor of Fine Arts in Theatre

The Bachelor of Fine Arts (B.F.A.) is conferred upon any student who complies with the general regulations of the University concerning degrees, satisfies all entrance and divisional requirements, and completes one of the curriculums of the Division of Theatre with a 2.0 (C) grade-point average:

A. Acting
B. Design and Technical Theatre
C. Musical Theatre
D. General Theatre

For admission to the junior year of the Division of Theatre, a student must have established a 2.0 (C) grade-point average.

Transfer students must establish transfer credit from other institutions during the first semester in which they are enrolled in the Division of Theatre. Those electing the Musical Theatre curriculum must arrange an audition in the summer or fall before commencing work in the program.

Students are responsible for correctly fulfilling all requirements. Each student should review the course requirements both before and after every registration period so that errors or omissions will be detected immediately.

Teacher Certification

Although there is no teacher certification with a speciality in theatre, students planning to teach theatre at the high school level will pursue certification in oral communication, which may include course work in theatre.

Theatre Curriculums

The applied program provides a theatre student with a complete experience in all of the basic theatre skills and crafts. In addition to the general scope of the program, the student may select an area of specialization in Acting, Design and Technical Theatre, General Theatre, or Musical Theatre.

ACTING

FIRST YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 75	3	Theatre 76	3
Theatre 51	3	Theatre 52	3
Theatre 100 or or 105	4	Theatre 105 or or 100	4
Art 30	3	Theatre 95	3
Engl. 1	3	Engl. 2	3
Dance 17	1	Core B	3
	17		19

SECOND YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 175	3	Theatre 176	3
Theatre 150	3	Theatre 151	3
Theatre 110	3	Theatre 107	3
Core C	4	Core C	4
Core B	3	Music 30	3
G.P.E. 25	1	Theatre 179	2
	17		18

THIRD YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 177	3	Theatre 178	3
Theatre 295	3	Theatre 296	3
Theatre 180	3	Theatre 260	2
Core B	3	Electives	6
Core C	4		
Theatre 179	2		
	18		14

FOURTH YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 275	3	Theatre 276	3
Theatre 166	2	Theatre 260	2
Theatre 297	3	Theatre 298	3
Theatre 260	2	Electives	6
Core B	3		
	13		14

Total: 130 hr.

MUSICAL THEATRE

FIRST YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 75	3	Theatre 76	3
Theatre 51	3	Theatre 52	3
Theatre 100 or or 105	4	Theatre 95	3
Music 41	2	Mus. 110 (Voice)	2
Music 110	2	Mus. 110 (Piano)	2
Engl. 1	3	Core B	3
Dance 17	1	Engl. 2	3
	18		19

SECOND YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 175	3	Theatre 176	3
Theatre 110	3	Theatre 151	3
Core C	4	Theatre 105 or 100	4
Music 110	2	Core B	3
Theatre 150	3	G.P.E. 25	1
		Music 110	2
		Theatre 179	2
	15		18

THIRD YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 177	3	Theatre 178	3
Theatre 295	3	Theatre 296	3
Theatre 240	3	Theatre 241	3
Theatre 180	3	Core C	4
Core B	3	Theatre 179	2
Music 110	2	Music 110	2
	17		17

FOURTH YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 275	3	Theatre 276	3
Theatre 166	2	Theatre 260	2
Theatre 260	2	Core C	4
Core B	3	Elective	3
Music 110	2	Music 110	2
	12		14

Total: 130 hr.

DESIGN AND TECHNICAL THEATRE

FIRST YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 74	3	Theatre 95	3
Theatre 100 or 105	4	Theatre 105 or 100	4
Theatre 106	3	Art 122	3
Art 121	3	Engl. 2	3
Engl. 1	3	G.P.E. 2	1
G.P.E. 1	1	Core B	3
	17		17

SECOND YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 110	3	Theatre 107	3
Theatre 195	3	Theatre 196	3
Theatre 161	3	Theatre 168	3
Theatre 167	3	Theatre 201 or 205	3
Theatre 179	2	Core B	3
Core C	3	Core C	3
	17		18

THIRD YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 180	3	Theatre 203	3
Theatre 206	3	Theatre 262	3
Theatre 260	2	Theatre 267	3
Theatre 267	3	Theatre 296	3
Theatre 295	3	Core C	3
Core B	3		
	17		15

FOURTH YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 260	2	Theatre 267	3
Theatre 267	3	Theatre 201 or 205	3
Theatre 297	3	Theatre 298	3
Core B	3	Core C	3
Music 30	3	Elective	3
	14		15

Total: 130 hr.

GENERAL THEATRE

FIRST YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 51	3	Theatre 95	3
Theatre 75	3	Theatre 105 or or 100	4
Theatre 100 or 105	4	Core B	3
Art 30	3	Engl. 2	3
Engl. 1	3	Core C	3
G.P.E. 1	1	Dance 17	1
	17		17

SECOND YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 106	3	Theatre 166	2
Theatre 110	3	Theatre 179	2
Theatre 179	2	Theatre elective	3
Core B	3	Core B	3
Core C	3	Music 30	3
Elective	3	Core C	3
	17		16

THIRD YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 107	3	Theatre 180	3
Theatre 295	3	Theatre 260	2
Theatre elective	3	Theatre 296	3
Engl. 150	3	Theatre elective	3
Core B	3	Elective	3
		Core C	3
	15		17

FOURTH YEAR

First Sem.	Hr.	Second Sem.	Hr.
Theatre 260	2	Theatre 260	2
Theatre 290	3	Theatre 298	3
Theatre 297	3	Theatre elective	3
Theatre elective	3	Electives	6
Electives	6		
	17		14

Total: 130 hr.

Courses of Instruction in Theatre (Theat.)

30. *Appreciation of Theatre.* I, II. 3 hr. *(Open to all students.)* Develops an appreciation and understanding of theatre as a fine art.

50. *Oral Interpretation.* I, II. 3 hr. *(Open to all students.)* Development of mental and emotional responsiveness to written materials. Techniques of communicating through oral reading.

51. *Vocal Techniques 1.* I. 3 hr. Concentration on the basic techniques of vocal production: relaxation, posture, body balance, breathing capacity, and facial muscularity and dexterity.

52. *Vocal Techniques 2.* II. 3 hr. PR: Theat. 51. Continuation of Theat. 51: resonance and projection, articulation and pronunciation acuity.

74. *Acting.* I, II. 3 hr. *(Open to all students.)* Basic theories and concepts in stage acting for the beginning student. Emphasis on the physical, intellectual, emotional, and personality languages of acting.

75. *Acting 1.* I. 3 hr. A workshop to stimulate direct and personal contact with elements of stage reality (place, activity, relationship, etc.) through use of improvisation and theatre games.

76. *Acting 2.* II. 3 hr. PR: Theat. 75. Continuation of Theat. 75.

95. *Basic Theatre Concepts.* I. 3 hr. Theatrical concepts based upon an examination of historical conventions and play analysis.

100. *Fundamentals of Technical Theatre.* I, II. 4 hr. Fundamentals of scenery construction and lighting through formal lecture and practical crew experience. Laboratory requirements include assignments on construction and running crews.

105. *Fundamentals of Costume Construction.* I, II. 4 hr. Fundamentals of costume construction through formal lecture and practical crew experience. Laboratory requirements include assignments on costume construction and running crews.

106. *Fundamentals of Theatre Design.* I. 3 hr. Fundamentals of costume and scenery design, its aesthetics and process.

107. *Fundamentals of Theatre Lighting.* I, II. 3 hr. PR: Theat. 100, 105. Basic technique in stage lighting. Practical experience on University Theatre lighting crews.

110. *Theatre Makeup.* I, II. 3 hr. Lecture-laboratory course in art of stage makeup. Practical makeup for University Theatre productions.

150. *Vocal Techniques 3.* I. 3 hr. PR: Theat. 51, 52. Application of the basic techniques of vocal production in prose literature and drama.

151. *Vocal Techniques 4.* II. 3 hr. PR: Theat. 51, 52, 150. Continuation of Theat. 150.

161. *Sceno-Graphic Techniques.* I. 3 hr. PR: Theat. 106. Study of drafting conventions in scenery, lighting, costumes, and properties. Emphasis on problem-solving through professional presentation.

166. *Theatre Management.* I, II. 2 hr. Practical experience in operation of a box office and the handling of promotion for theatre productions.

167. *Theatre Design 1.* I. 3 hr. PR: Theat. 106. Study of costume and stage design through various rendering techniques.

168. *Theatre Design 2.* II. 3 hr. PR: Theat. 167. Study of theatrical design and the development of design styles through various rendering techniques.

175. *Intermediate Acting 1.* I. 3 hr. PR: Theat. 75, 76. Introduction of the reality of doing the repetition exercises, adjustment with fellow actors, independent activity, justification, simple objectives. To free the impulses of the young actor within the structure of the improvisational exercise.

176. *Intermediate Acting 2.* II. 3 hr. PR: Theat. 75, 76, 175. Beginning work with daydream/fantasy. Incorporation of emotional preparation into repetition exercise. Enriched work on personalizing imaginary circumstances. Introduction to relationship. To sustain young actors with true inner life from moment to moment.

177. *Intermediate Acting 3.* I. 3 hr. PR: Theat. 75, 76, 175, 176. Introduction to interpretation with emotional colors of Theat. 175, 176. Introduction to characterization work through physical impediment. Introduction of character idea. To organize and sychronize the student to role with rich inner life.

178. *Intermediate Acting 4.* II. 3 hr. PR: Theat. 75, 76, 175, 177. Script work with introduction of single action exercise and monologue. Text work includes particularization, beats, paraphrasing, and dialogue justification. To play the reality of the action from a consistent meaningful point of view.

179. *Directed Theatre Activities.* I, II. 0-3 hr. *(May be repeated for max. of 6 hr. credit.)* PR: Consent. Assigned theatre projects supervised by faculty.

180. *Directing.* I, II. 3 hr. Fundamentals of directing stage plays. Emphasis on the work of the director in relation to the actor, stage, business, composition, movement, and rehearsal schedule.

195. *Costume History 1.* I. 3 hr. Detailed study of modes and manners in dress from ancient Egypt through the Renaissance.

196. *Costume History 2.* II. 3 hr. Detailed study of modes and manners in dress from the late Renaissance to the present.

200. *Directed Theatre Studies.* I, II. 3-12 hr. *(May be repeated for max. 12 hr. credit.)* PR: Consent. Studies in theatre history, performance, stage design and technology, and theatre crafts. Subject matter and number of sections varies from semester to semester.

201. *Advanced Costume Construction.* I, II. 3-12 hr. *(May be repeated for max. 6 hr. credit.)* PR: Theat. 105. Study and practical application of costume construction through flat pattern, draping, and period pattern projects. Production assignments on theatre productions.

203. *Advanced Theatre Lighting Design.* I. 3 hr. PR: Theat. 103 or consent. Advanced theories of lighting and design for the stage. Practical experience with advanced lighting equipment.

205. *Advanced Technical Theatre.* I, II. 3 hr. *(May be repeated for max. 6 hr. credit.)* PR: Theat. 106, 107. Detailed study of scenery construction. Research projects, technical drawings, welding, properties construction, and study of new materials. Practical experience through work on productions.

206. *Stage Management.* I, II. 3 hr. PR: Theat. 106, 107, or consent. Detailed study of the role of the stage manager. Some stage management of Division of Theatre productions may be required.

240. *Music Theatre Workshop 1.* I. 3 hr. PR: Consent. *(Open to voice music majors.)* Training in musical and dramatic performance through their joint application in contemporary musical theatre forms.

241. *Music Theatre Workshop 2.* II. 3 hr. PR: Theat. 240. *(Open to voice music majors.)* Continuation of Theat. 240, focusing upon earlier stylized works.

250. *Advanced Problems of Vocal Production.* I. (Alternate Years.) 3 hr. PR: Consent. Concentration on the voice and special problems of production, particularly vocal. Dialects and specific character vocal qualities.

251. *Vocal Production Performance.* II. (Alternate Years.) 3 hr. PR: Consent. The amalgamation and synthesis of all the vocal skills of performance incorporated in original theme productions.

260. *Theatre Performance and Rehearsal Laboratory.* I, II. 1-3 hr. *(May be repeated for max. 9 hr. credit.)* PR: Theatre major and consent. Participation is assigned theatre projects. Appreciation of creativity and performance techniques in theatre.

262. *Scene Painting.* II. 3 hr. PR: Theat. 168 or consent. A study in the basic techniques used in preparing and painting scenery. Practical experience in painting scenery for theatre productions.

267. *Advanced Problems in Theatre Design.* I, II. 3 hr. *(May be repeated for a max. 12 hr. credit.)* PR: Theat. 167, 168. A detailed study of costume and set design through in-depth design projects.

275. *Advanced Acting 1.* I. 3 hr. PR: Consent. Seeks to present advanced theories in acting to include script analysis, modern and historical, and to train the actor in advanced skills. Concentration upon broadening the actor's range.

276. *Advanced Acting 2.* II. 3 hr. PR: Consent. Extensive and intensive study of acting styles.

278. *Repertory Theatre.* 1-6 hr. *(May be repeated for max. 12 hr. credit.)* PR: Consent. Rehearsal and performance techniques for producing plays in rotating repertory. Emphasis is on the creation of a synthesized company of performers, designers, and technicians.

280. *Advanced Play Directing.* II. 3 hr. PR: Theat. 180 or consent. Emphasis on the work of the director as on integrating artist. High level of proficiency in the direction of a one-act play is required of all students enrolled. *(Course will not be offered in 1983-84.)*

282. *Creative Dramatics.* I, II, S. 3 hr. PR: Theat. 75 or consent. Study and practice of creative dramatic activity as a method of learning and self-development for children.

284. *Puppetry.* I, II. 3 hr. PR: Theat. 75 or consent. Comprehensive survey of construction and manipulation techniques of puppets. Evaluation of the role of puppetry in child behavior and therapy techniques.

290. *Playwriting.* I, II. 3 hr. PR: Consent. Development of basic playwriting techniques. Specific assignments explore characterization, dramatic event, dialogue, tension, compression. Emphasis on the student finding one's own voice, style, and courage to dramatize one's view of the world.

291. *Advanced Playwriting.* II. 3 hr. PR: Theat. 290. Further exploration of dramatic technique, with emphasis on orchestrating the longer play. Also touches on script analysis of known dramatic texts and on practical problems of a playwriting career.

295. *Classic Theatre to 1700.* I. (Alternate Years.) 3 hr. A survey of theatre history, with emphasis on the development of performance conditions, from classical antiquity through the middle of the seventeenth century.

296. *European and American Theatre, 1700-1850.* II. 3 hr. A survey of theatre history, with emphasis on the development of performance conditions, from the middle of the seventeenth century to the rise of Realism in the 1840s.

297. *Modern Theatre, 1850-1940.* I. (Alternate Years.) 3 hr. A survey of theatre history, with emphasis on the development of performance conditions, from the middle of the nineteenth century to the outbreak of World War II.

298. *Contemporary Theatre Since 1940.* II. (Alternate Years.) 3 hr. A survey of theatre history, with emphasis on the development of performance conditions, from World War II to the present.

307. *Light and Sound Seminar.* II. 3 hr. PR: Theat. 203 or equiv. An in-depth exploration of advanced lighting and sound for the theatre with particular emphasis on repertory lighting, dance, and opera.

331. *Research Methods and Survey.* I. 3 hr. PR: Consent. Research methods and techniques for theatre artists, scholars, and designers.

332. *Auditions and the Acting Profession.* I. 3 hr. PR: Theat. 376. Study of audition techniques, employment, unions, requirements of Actors' Equity Association.

333. *Seminar in Production Research.* II. 3 hr. PR: Theat. 331, 367. Seminar approach to individual design projects with oral and written presentation of research materials. Intensive critique within class by faculty and peers.

334. *Theatre Design—Portfolio Preparation.* I. 3 hr. PR: Theat. 307, 333. An in-depth work in packaging and presentation of portfolio work, job opportunities, and preparation for professional union examinations.

367. *Theatre Design.* I. 3 hr. *(May be repeated for max. 9 credit.)* PR: Theat. 267 or equiv. A lecture/studio course in scenery and costumes. Intense practical experience in drawing, painting and model building for portfolio presentation.

375. *Acting Technique 1.* I. 3 hr. PR: Consent. To provide a structured repetition exercise in order to free the impulses of the advanced actor. Independent activities, justification, and moment to moment work are introduced. Amending scene work required.

376. *Acting Technique 2.* II. 3 hr. PR: Theat. 375. To refine the daydream work for the practiced actor. The incorporation of emotional preparation to develop the ability to retain inner life with adjustment. Amending scene work required.

377. *Acting Technique 3.* I. 3 hr. PR: Theat. 376. Advanced interpretation work, emphasizing physical alteration and character idea for the seasoned actor. Internal independent activities taught with the single actor exercise. Amending scene work required.

378. *Acting Technique 4.* II. 3 hr. PR: Theat. 377. Detailed study of text to include dialogue justification and particularization for the trained actor. Extensive monologue work and amending scene work required.

379. *Rehearsal and Performance.* I. 3 hr. *(May be repeated for max. 12 hr. credit.)* PR: Consent. Participation in assigned performance projects.

381. *Period Acting.* II. 3 hr. PR: Theat. 377. Creating and sustaining characters and action in texts from major theatrical periods.

382. *Dialects.* II. 3 hr. PR: Theat. 375. The study of common dialects used in the theatre supplemented by the International Phonetic Alphabet as a tool for vocal work.

395. *Period Style 1.* I. 3 hr. PR: Theat. 167 or equiv. An in-depth exploration of architecture, costumes, customs, and ornamentation in period style for the theatre from Egyptian through Renaissance.

396. *Period Style 2.* II. 3 hr. PR: Theat. 395 or equiv. An in-depth exploration of architecture, costumes, customs, and ornamentation in period style for the theatre from the Baroque to the present.

School of Dentistry

Dental Hygiene Program

The Dental Hygiene Program is a department of the School of Dentistry. The four-year dental hygiene curriculum combines the advantages of both a liberal arts and professional education. Upon completion of all requirements and with the recommendation of the School of Dentistry, the candidate is awarded a degree of Bachelor of Science in Dental Hygiene (B.S.).

The Dental Hygiene curriculum is structured in accordance with standards specified for a dental hygiene program by the Commission on Accreditation of the American Dental Association. The WVU program has been fully accredited by this organization since 1965.

Admission

Students enter dental hygiene as freshmen, and the general admission policies of WVU are followed. The applicant must be a graduate of an accredited high school or preparatory school and have completed 1 unit of plane geometry, biology, and chemistry, 2 units of algebra, and 4 units of English. Good grades are expected, and applicants should rank in the upper one-third of their graduating classes. Particular attention is given to academic achievement in science courses.

The American College Test (ACT) examination is required of high school applicants. High school counselors can supply information concerning this examination. The Dental Hygiene Aptitude Test is required of every applicant. A brochure with detailed information about the test is mailed with application materials, or may be obtained by writing American Dental Hygientists' Association, Suite 1136, 666 N. Lake Shore Drive, Chicago, IL. 60611.

In addition to a special application form for dental hygiene, each candidate for admission is supplied with three standardized reference forms. Each applicant is required to have these completed by one dental hygienist and two other individuals who know them personally, and have these individuals return the forms directly to the WVU Department of Dental Hygiene.

The personal qualifications, scholastic record, test scores, and recommendation of each applicant are reviewed by the Dental Hygiene Admissions Committee. After reviewing these credentials, the committee will request a personal interview with those applicants who are most qualified. The applicant will be notified by letter of the date, time, and place of the interview. The competition for entrance into dental hygiene is extremely keen. *Nonresidents should recognize that preference in admissions is given to West Virginia residents. Only those nonresidents with the highest qualifications will be considered.*

For application materials the applicant should write to: Department of Dental Hygiene, West Virginia University, or Office of Admissions and Records, WVU Medical Center, Morgantown, WV 26506. Applicants should apply and complete aptitude tests as early as possible in the year preceding the year admission is desired. Applications are available in September and are not accepted after March 1.

(Complete information concerning the Dental Hygiene program at WVU may be obtained in the *WVU Medical Center Catalog.*)

College of Engineering

Engineering is the profession in which a knowledge of the mathematical and natural sciences gained by study, experience, and practice is applied with judgment to develop ways of economically utilizing the materials and forces of nature for the benefit of mankind.

The western world, and especially the United States, often has been characterized as a technological society. This phrase reflects the great impact that engineering has had on western society. Forecasts of the expected state of the world by the year 2000 suggest that large-scale systems will be created for the development, control, and use of our natural resources and that development will continue in automated manufacturing, synthetic foods, rapid transportation systems, space programs, defense systems, energy technology, and biosocial systems having to do with medical advances, housing, community development, and pollution control. Engineering will play the major role.

Society's needs in the decades ahead will demand engineering talent on a scale never before seen. The engineer will be called upon, not only to create, but to coordinate technological advances more effectively into large-scale social systems such as vast metropolitan complexes.

The College of Engineering programs are administered through five departments: Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical and Aerospace Engineering. Its undergraduate programs are recognized by industry as ranking with the best in the nation. The curricula have been planned to give the student a balanced background in the basic sciences, engineering sciences, engineering analysis, the humanities, and the social sciences. In addition, each curriculum features creative programs in engineering synthesis and design. This blend of science and practice has been developed to give the student the tools to solve today's problems and the background to develop the expertise needed for the future.

The College of Engineering staff uses modern teaching techniques, including programmed material, guest lectures by visiting authorities, and team project and in-house industrial assignments to provide a breadth of training experiences.

Teaching laboratories are equipped with modern instruments, machines, and tools to improve and enrich the student's understanding of engineering principles and problems. Analog and digital computer laboratories and facilities are available for classroom work.

Graduate programs, dedicated to the development of engineering practice, engineering science, and research, are offered in numerous creative specialities. Both master's and doctor's degrees are offered. These exciting programs, where the frontiers of knowledge are explored through study and research, provide an academic environment in which all programs—undergraduate and graduate—are updated constantly to give the student the professional education needed in a technolgical-scientific society.

EAC/ABET Accreditation

The Accreditation Board for Engineering and Technology (ABET) is recognized by the U.S. Department of Education and the Council on Postsecondary Accreditation (COPA) as the sole agency responsible for accreditation of educational programs leading to degrees in engineering.

ABET accomplishes its accreditation mission through one of its commissions, the Engineering Accreditation Commission (EAC).

ABET, through its participating bodies (American Academy of Environmental Engineers, American Congress on Surveying and Mapping, American Institute of Aeronautics and Astronautics, Inc., American Institute of Chemical Engineers, American Institute of Industrial Engineers, Inc., American Institute of Mining, Metallurgical and Petroleum Engineers, American Nuclear Society, American Society of Agricultural Engineers, American Society of Civil Engineers, American Society for Engineering Education, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., The American Society of Mechanical Engineers, The Institute of Electrical and Electronics Engineers, Inc., National Council of Engineering Examiners, National Institute of Ceramic Engineers, National Society of Professional Engineers, Society of Automotive Engineers, Society of Manufacturing Engineers, and Society of Naval Architects and Marine Engineers) is concerned with the enhancement of the status of the engineer and the engineering profession, and the establishment of criteria and standards for accreditation of engineering programs at colleges and universities.

All baccalaureate degree granting programs in the College of Engineering at West Virginia University are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Faculty

College of Engineering—Administration

Curtis J. Tompkins, Ph.D. (Ga. Tech.), *Dean of Engineering.*

G. Lansing Blackshaw, Ph.D. (N.C. St. U.), *Associate Dean of Engineering—Academic Affairs.*

Ralph E. McKelvey, P.E., M.S.M.E. (Case Inst. Tech.), *Associate Dean of Engineering—Administration.*

Hermann Viets, Ph.D. (Poly. Inst. Brooklyn), *Associate Dean of Engineering—Research.*

Engineering Experiment Station—Administration

Curtis J. Tompkins, Ph.D. (Ga. Tech.), *Director.*

Aerospace Engineering

(*See* Mechanical and Aerospace Engineering)

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Joseph D. Henry, Jr., Ph.D. (U. Mich.), *Professor and Chairperson of Chemical Engineering.*

Richard C. Bailie, Ph.D. (Iowa St. U.), *Adjunct Professor.*

G. Lansing Blackshaw, Ph.D. (N.C. St. U.), *Professor of Chemical Engineering; Associate Dean.*

Eugene V. Cilento, Ph.D. (U. Cincinnati), *Assistant Professor of Chemical Engineering.*

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Alfred F. Galli, P.E., M.S.Ch.E. (WVU), *Professor of Chemical Engineering.*

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J. Christopher Ludlow, Ph.D. (U. Va.), *Assistant Professor of Chemical Engineering.*

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Jer Y. Shang, Ph.D. (Brooklyn Polytech), *Adjunct Associate Professor.*

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Industrial Engineering

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Donald T. Worrell, P.E., M.S.E. (WVU), *Professor Emeritus.*
William S. Ziegler, *Visiting Lecturer.*

Freshman Program

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Admission

General requirements for admission to the College of Engineering are that all prospective students must be qualified for admission to WVU and present secondary school credits for 2 units of algebra, 1 unit of geometry, and ½ unit of trigonometry or advanced mathematics. Additional freshman-year admission requirements for West Virginia residents and out-of-state residents, plus special admission policies for transfer students, are noted below:

First-Year Students

All applicants must take the Standard ACT test, and have official copies of ACT test scores filed with the Office of Admissions and Records before an admissions decision is made.

West Virginia Residents: Automatic admission to the College of Engineering will be granted based upon achievement of a high school grade-point average of 3.0 or better at graduation and a Standard ACT Mathematics score of 18 or higher, *or* a Standard ACT Mathematics score of 24 or better.

Out-of-State Residents: Minimum conditions for admission to the College of Engineering are achievement of a high school grade-point average of 3.4 or better at graduation and a Standard ACT Mathematics score of 18 or higher, *or* a Standard ACT Mathematics score of 28 or better. Since there is a limited number of places in the College of Engineering for out-of-state residents, early application is strongly encouraged.

First-year students not admitted to the College who desire to study engineering should seek to enroll in the General Studies Program of the College of Arts and Sciences, and attempt to gain transfer student admission to the College as noted below:

Transfer Students: Students wishing to transfer into the College of Engineering from another WVU college or school, or an outside college or university, must satisfy both the WVU general admission requirements and as a *minimum:*

1. Have a grade-point average of 3.0 or higher for all college-level work attempted.

2. Have completed Mathematics 15 and 16 and Chemistry 15 and 16 *or* Physics 11 and 12 (or their equivalents) with an average of 2.5 or better in each of the mathematics, and chemistry or physics areas.

Students not meeting these minimum transfer requirements, but who display special aptitude for engineering studies, may request to be admitted to the College of Engineering by written petition to the Associate Dean for Academic Affairs.

Engineering courses will be open only to students formally admitted to the College of Engineering and those students in other colleges and schools which specify engineering courses as curriculum requirements—provided, in each case, that the students have the specified prerequisite or corequisite subjects. In no instance will students in General Studies—or other programs at WVU—who wish to transfer to the College of Engineering be permitted to enroll in engineering courses before being officially accepted as an engineering major.

Applications for transfer student admission to the College of Engineering must be received according to the schedule below:

Desired Date of Entry:	*Deadline Date for Receipt of Application*
Summer Session, or First Semester	Preceding March 15
Second Semester	Preceding November 1

The number of transfer students accepted into the College of Engineering will be governed by the enrollment capacities of each of the six undergraduate engineering programs. First admission priority will be granted to those students currently matriculated at WVU and in pre-engineering programs at state colleges and universities within West Virginia; second priority to students enrolled in pre-engineering type programs at non-state institutions; and third priority to students in non-engineering curricula at external colleges and universities. Within the three categories cited above, preferential admission will be in the following order: West Virginia residents, non-West Virginia U.S. residents, and foreign students.

Complete information concerning WVU admission, registration, fees and expenses, and regulations is contained in Part 2 of the *Undergraduate Catalog*.

Requirements for Degrees

To be eligible to receive a bachelor's degree in any branch of engineering for which degrees are offered, a student must be admitted to the College, satisfactorily complete the number of semester hours of work as specified in the curriculum of the department leading to the degree for which the student is a candidate, and satisfy any special proficiency requirements stated by the department.

In order to receive a degree in the College of Engineering, a student must be registered in his or her major department during the final semester in residence. In the case of dual degrees, completion out of residence, or other exceptions, arrangements must be made with the chairperson of the major department at least four months before the expected graduation date.

Credit Hour Limitation

The maximum student credit load is 20 hours per semester without prior approval of the Committee on Academic Standards.

College of Engineering Curricula

During the first two years the curricula provide a well-rounded training in English and the basic sciences of mathematics, chemistry, and physics. This is accompanied by courses stressing fundamental engineering concepts,

skills, and methodology, plus introductory courses in the major field. A student does not have to definitively select a major program of study until the beginning of the second year.

In the third and fourth years, special emphasis is placed on the professional work of the engineer. In these years a certain number of credit hours are usually available for technical and professional electives.

Courses in the humanities and social sciences are taken throughout the four years.

The curricula lead to:

1. The degree of Bachelor of Science in Aerospace Engineering.
2. The degree of Bachelor of Science in Chemical Engineering.
3. The degree of Bachelor of Science in Civil Engineering.
4. The degree of Bachelor of Science in Electrical Engineering.
5. The degree of Bachelor of Science in Industrial Engineering.
6. The degree of Bachelor of Science in Mechanical Engineering.

Curriculum in Aerospace Engineering

Degree: Bachelor of Science in Aerospace Engineering

Aerospace travel, space exploration, and flight of manned or unmanned vehicles continue to gain significance in modern activities. Aerospace Engineering is involved with the science and technology of advanced vehicles, including aircraft, rockets, missiles and spacecraft. Although a special branch of engineering, it is also diverse. Aerospace technology has expanded to include design and development of new earthbound vehicles such as ground effect machines, hydrofoil ships and high speed rail-type systems. Wind engineering and wind energy conversion are also current topics of study.

The Aerospace Engineering program at WVU is designed to prepare the student for a career in the aerospace industries and in government research and development centers and laboratories, as well as in military mission-oriented agencies. The undergraduate curriculum also allows the student to prepare for graduate studies in aerospace engineering science and in other engineering and nonengineering fields.

The aerospace engineering curriculum includes studies in the disciplines encountered in the design of aerospace vehicles, missiles, rockets, and spacecraft. The undergraduate student studies extensively the basic principles of fluid dynamics, solid mechanics and structures, stability and control, and thermal sciences and propulsion. The student is involved in both theoretical and experimental studies, and trained to integrate knowledge with practical engineering design. With the breadth and depth of education in aerospace engineering, the student becomes a versatile engineer, competent to work in many areas. The curriculum may serve as a terminal program by incorporating design-oriented courses for technical electives, or it may be used as a preparatory program for advanced study by the selection of science-oriented courses.

A blend of theoretical and experimental expertise within the faculty exposes students to real-world problems. Recent projects, such as design, construction, and testing of an STOL (short-take off-and-landing distance) aircraft and several wind turbines, illustrate this point.

For those students who wish to pursue a career in medicine, dentistry, or related areas, but desire an aerospace engineering degree before entering the appropriate professional school, certain course substitutions may be made. These substitutions include biology (8 hours) and organic chemistry (8 hours)

to be substituted for 9 hours of technical electives and 3 hours of heat transfer. This selection will help the student satisfy admission requirements to the professional schools in the health sciences.

The aerospace engineering program at WVU is administered by the faculty of the Department of Mechanical and Aerospace Engineering.

AEROSPACE ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
Engl. 1	3	Engr. 2	3	Phys. 11	4	Phys. 12	4
Eng. 1	3	Chem. 16	4	M.A.E. 10	2	M.A.E. 11	2
Chem. 15	4	Non-tech. elect.	6	M.A.E. 41	3	M.A.E. 43	3
Non-tech. elect.	3			Engl. 2	3	Non-tech. elect.	3
	17		17		16		16

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
M.A.E. 42	3	M.A.E. 112	4	M.A.E. 100	Cr.	M.A.E. 120	3
M.A.E. 111	3	M.A.E. 142	3	M.A.E. 115	3	M.A.E. 250	3
M.A.E. 140	3	M.A.E. 161	3	M.A.E. 150	3	Technical elect.	6
M.A.E. 160	3	E.E. 106	4	M.A.E. 165	2	Non-tech. elect.	6
E.E. 105	4	Non-tech. elect.	3	Math. elect.	3		
				Technical elect.	3		
				Non-tech. elect.	3		
	16		17		17		18

Non-technical elective Core Curriculum courses must consist of 12 hr. of Group A and 12 hr. of Group B, and at least two subjects in each group; 18 hr. must be core courses on the College of Engineering-approved list.

Two technical electives must be selected from aerospace engineering courses in the 200 or 300 series.

Curriculum in Chemical Engineering

Degree: Bachelor of Science in Chemical Engineering

The Chemical Engineering curriculum is designed to give the graduates a broad background of chemical engineering processes and prepare them to become professional engineers.

Students are prepared for positions in operation, development, design, construction, and management of industrial plants. These industries subject raw materials to chemical and physical changes and produce economically desirable products.

A comprehensive background in basic science, mathematics, and humanities courses is scheduled. Electives are available for specialization in fields such as polymers, nuclear energy, coal conversion, mathematical modeling, and separations. Practical work on design and synthesis is incorporated into all chemical engineering courses.

The fourth-year senior courses introduce the student to the actual practice of chemical engineering. A comprehensive plant design project provides the core for the senior program. Throughout the year the class work emphasizes reactor design, process dynamics, design of experiments, and professional practice and ethics. Integrated into this program are oral and written technical communications.

CHEMICAL ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
Chem. 15	4	Chem. 16	4	Chem. 133	3	Chem. 134	3
Engr. 1	3	Engr. 2	3	Chem. 135	1	Chem. 136	1
Engl. 1	3	Elect. (SS-Hum.)	6	Phys. 11	4	Phys. 12	4
Elect. (SS-Hum.)	3			Ch.E. 40	3	Ch.E. 41	3
				Engl. 2	3	Ch.E. 238 (Math. elect.)	3
	17		17		18		18

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 246	3	Chem. 248	3	M.A.E. 41	3	M.A.E. 43	3
Ch.E. 110	3	Chem. 142	1	Ch.E. 170	3	Ch.E. 171	3
Ch.E. 111	3	Ch.E. 112	4	Ch.E. 172	3	Ch.E. 175	3
Ch.E. 142	4	Ch.E. 145	3	Ch.E. 180	1	Ch.E. 181	1
Electives	6	Electives	6	Ch.E. 190	1	Ch.E. 191	1
				Electives	6	Electives	6
	19		17		17		17

Only 6 credits of ROTC can count toward Core B requirements and none toward Core A.

Electives in junior and senior years must be selected to complete requirements of non-technical electives (24 hr.), a technical elective (3 hr.), an Engineering Science elective (3 hr.), and an advanced Chemistry elective (3 hr.). All electives must be selected from a list of electives approved by the Department of Chemical Engineering.

A 2.0 grade-point average in required chemical engineering courses is necessary before a student can register in Ch.E. 110, 142, 170, or 171.

Curriculum in Civil Engineering

Degree: Bachelor of Science in Civil Engineering

The primary emphasis of the undergraduate program in Civil Engineering is to educate a professional engineer who will be expected to assume the role of problem solver, decision maker, and technical leader, and one whose education background will undergird the continuing development required for practice during a forty-year career.

During the four-year program, civil engineering students are given a solid grounding in mathematics, physics, and chemistry to enable them to understand the fundamental principles of engineering. Added to this is extensive development of the fundamentals of environment, soils, and materials, structural, and transportation systems engineering. To help the student to understand one's role in the community, to be effective in working in design teams involving other engineers and other professions, to be effective in leadership and decision making and to be effective as a spokesperson, the curriculum attempts to give the student a meaningful educational experience in the humanities, English, and economics. Some specialization is available through electives in advanced courses in transportation, sanitary engineering, structures, soil mechanics, or photogrammetry and surveying, which are available in civil engineering or related departments.

To be eligible for graduation in civil engineering, a student must attain a grade-point average of 2.0 or better for all civil engineering courses attempted, except for those courses in which a grade of W or WU was received. If a course is repeated only the last grade received will be counted in computing the grade-point average; when a course is repeated, the course credit hours will be counted only once. This requirement assures that the student has demonstrated overall competence in the chosen major.

CIVIL ENGINEERING

FIRST YEAR

First Sem.	Hr.	Second Sem.	Hr.
Math. 15	4	Math. 16	4
Engl. 1	3	Engr. 2	3
Engr. 1	3	Chem. 16	4
Chem. 15	4	Non-tech. elect.	3
Non-tech. elect.	3	Non-tech. elect.	3
	17		17

SECOND YEAR

First Sem.	Hr.	Second Sem.	Hr.
Math. 17	4	Math. 18	4
Phys. 11	4	Phys. 12	4
M.A.E. 41	3	M.A.E. 42	3
Geol. 1	3	M.A.E. 43	3
Engl. 2	3	C.E. 90	2
		Non-tech. elect.	3
	17		19

THIRD YEAR

First Sem.	Hr.	Second Sem.	Hr.
C.E. 101	4	C.E. 120	4
C.E. 110	4	C.E. 132	4
C.E. 160	3	C.E. 180	4
C.E. 195	Cr	C.E. 195	Cr
Engl. 208	3	C.E. 260	3
Eng. Sci. elect.	3	Non-tech. elect.	3
	17		18

FOURTH YEAR

First Sem.	Hr.	Second Sem.	Hr.
C.E. 146	3	C.E. elect.	8
C.E. 147	3	C.E. 196	1
C.E. 196	1	Math/Sci elect.	3
I.E. 277	3	Non-tech. elect.	6
C.E. Design elect.	3		
Struct. Des. elect.	3		
	16		18

1. Structural design elective must be selected from C.E. 270 or 271.
2. Engineering Science electives are to be selected from C.E. 240, E.E. 105, M.A.E. 111, 200, 204, 222, and either M.A.E. 101 or 104.
3. Civil engineering electives must be 200-level Civil Engineering courses.
4. Civil engineering design electives must be selected from the following: C.E. 212, 231, 233, 252, 270, 271, 274, or 281.
5. Mathematics/Science electives can be any engineering science elective, or any of the following: Bact. 141; Biol. 246; Ag. Bi. 210; Chem. 115, 131, 141; Geol. 151, 184, 221, 222; Math. 113, 241, 256, 291; I.E. 213.
6. Nine hours of non-technical electives must be selected from one of the following areas. The entry-level course for each area is italicized.

A. History of Science and Technology: *Hist. 212*, 11, 12, 111, 175, 207, 208; Soc. & A. 5, 251; MDS 91; Phil. 158.
B. Victorian Era Studies: *MDS 91*; Hist. 12, 120, 157, 159, 208, 242; Engl. 265, 266, 267.
C. Appalachia: *Hist. 153*, 175, 261; Engl. 113, 225; Soc. & A. 140.
D. Ethics and Human Behavior: *Phil. 4*, 13, 108, 150; Relig. 5, 150; Psych. 141; Pol. S. 214; Soc. & A. 102, 123, 136.
E. The City: (entry-level course to be developed). Geog. 210, 225; Hist. 273, 274; Soc. & A. 131; Pol. S. 121, 225; Econ. 257.
F. Science and Religion: (no entry-level course identified). Relig. 102 or 103, 100, or 101 or 105; an MDS course under development.

All additional non-technical electives must be selected to meet University Core Curriculum requirements and College of Engineering humanistic course requirements.

Curriculum in Electrical Engineering

Degree: Bachelor of Science In Electrical Engineering

The curriculum in Electrical Engineering has been developed to give the student general training in the field of electrical engineering. Some special training is available in the following fields as electives in the senior year: electric power, communications, control, solid state electronics, microwaves, antennas, and computing systems.

In the first two years of electrical engineering, work is limited to those subjects which are essential as preparatory courses for more technical courses in the third and fourth years. Fundamental courses in electrical engineering are introduced during the second year. In the third and fourth years the curriculum is mainly courses in electrical engineering and electives.

Technical electives are scheduled in the curriculum to permit a student to acquire more depth in the student's preferred area of electrical engineering. Thus, electives normally will be selected from 200-level electrical engineering

courses. However, the student's adviser may recommend, in some cases, that a student select technical electives from upper-level courses in mathematics, the sciences, or other areas of engineering as a part of the curriculum. The mathematics elective is to be selected from a department-approved list. Students should consult with their advisers to select a course from this list.

Students enrolled in the Department of Electrical Engineering will not be permitted to register for any electrical engineering courses until they have attained a grade of C or better in each of the electrical engineering courses which are prerequisite to that course. This rule is intended to insure that the student has mastered prerequisite material before advancing to more difficult material.

To be eligible for graduation in electrical engineering a student must attain a grade-point average of 2.0 or better for all electrical engineering courses attempted except for those courses in which a grade of W or WU was received. This rule serves the purpose of assuring that the student has demonstrated overall competence in the chosen major.

ELECTRICAL ENGINEERING

FIRST YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4
Engr. 1	3	Engr. 2	3
Engl. 1	3	Math. 16	4
Math. 15	4	Non-tech. elect.	3
Non-tech. elect.	3	Non-tech. elect.	3
	17		17

SECOND YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
E.E. 21	3	E.E. 24	3
E.E. 22	1	E.E. 25	1
E.E. 71	3	Math. 18	4
Math. 17	4	Phys. 11*	4
Phys. 12	4	M.A.E. 42	3
M.A.E. 41	3	Tech. elect. or Non-tech. elect.**	3
	18		18

THIRD YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
E.E. 124	3	E.E. 126	3
E.E. 127	1	E.E. 130	3
E.E. 140	3	E.E. 135	1
E.E. 151	4	E.E. 141	3
Math. or Stat. elect.	3	E.E. 156 & 157 (or 158 & 159)	2+1 (3+1)
Engl. 2	3	Non-tech. elect.	3
	17		16 (17)

FOURTH YEAR

First Sem.	*Hr.*	*Second Sem.*	*Hr.*
Econ. 54	3	Econ. 55	3
E.E. 131	3	E.E. 181	3
E.E. 136	1	Non-tech. elect.	3
E.E. 158 & 159 (or EE 156 & 157)	3+1 (2+1)	Tech. elect.	3
Non tech. elect. or Tech. elect.	3	Tech. elect.	3
Tech. elect.	3		
	18 (17)		15

*Physics 12 is scheduled before Physics 11 to allow Physics 12 corequisite requirement for Electrical Engineering courses in the first semester of the Sophomore year. Freshman students with a C or better in Math. 15 may, with adviser's approval, enroll in Physics 11 during the second semester of the freshman year in place of one of the non-technical electives.

**A total of 6 non-technical electives and 4 technical electives must be selected. The non-technical electives must be chosen so as to meet the Core requirements of WVU and the ABET program requirements.

Curriculum in Industrial Engineering

Degree: Bachelor of Science in Industrial Engineering

Industrial Engineering began in the latter part of the nineteenth century through the efforts of such pioneers as Frederick Taylor and Frank and Lillian Gilbreth. The Gilbreths are best known as leading figures in the book and movie entitled *Cheaper by the Dozen*. These early industrial engineers were

concerned with improving the effectiveness of manual industrial operations. They made remarkable savings possible through the use of motion and time studies and methods analysis. As industries became more complex, large scale systems, industrial engineers became concerned with additional areas of concern to management. Industrial engineers became involved in the design of production facilities using plant layout procedures. They also were developing quality control plans which are so important today in providing for consumer protection in product purchases. As production processes became more complex, the industrial engineer became involved in examining the range of manufacturing processes necessary to produce a product and how these can be utilized most effectively. In the late fifties and in the early sixties, the computer became a powerful new tool for use in solving management problems. Once the computer became economical, the industrial engineer became involved in using the computer to solve larger and more complex management problems through the use of such modern management science tools as operations research.

Today's students learn the fundamental principles which were developed years ago; however, the industrial engineering student of the eighties is increasingly more concerned with using the computer to solve industrial and social problems. At the same time, the industrial engineer has become even more involved with the human element of the organization. The industrial engineering area known as human factors is concerned with the individual's health, safety limitations, and capabilities as they relate to the job and the working environment.

The graduating industrial engineer has a versatile degree which can be used in every endeavor of society. Since the industrial engineer is involved in more effective management of organizations, the industrial engineer is not limited to any one industry. Many have found employment in such places as hospitals, farms, banks, retail stores, and virtually every governmental agency. Industries have found that their managers must have knowledge of both technical and management problems. The industrial engineer has an excellent blending of these two fields—technology and management. The top management of many of our largest organizations are industrial engineers.

The industrial engineering program at West Virginia University devotes considerable attention to the individual needs of the student. The faculty works extensively with students in such areas as communication skills, personal growth and development, and the creation of summer job opportunities. The goal of the department is to develop student strengths in technical abilities, personal development, general education, and practical experience.

INDUSTRIAL ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Math. 15	4	Math. 16	4	Math. 17	4	Math. 18	4
Engl. 1	3	Engr. 2	3	Phys. 11	4	Phys. 12	4
Engr. 1	3	Chem. 16	4	M.A.E. 41	3	M.A.E. 43	3
Chem. 15	4	Non-tech. elect.	6	Engl. 2	3	I.E. 170	3
Non-tech. elect.	3			I.E. 20	1	I.E. 113	3
				I.E. 140	3		
	17		17		18		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Econ. 54	3	Econ. 55	3	I.E. 291	3	M.A.E. 101	3
I.E. 214	3	I.E. 242	3	I.E. tech. elect.	3	I.E. 292	3
M.A.E. 42	3	I.E. 250	3	E.E. 105	4	I.E. tech. elect.	6
Ch.E. 105	3	I.E. 260	3	Non-tech. elect.	6	M.A.E. 115	3
I.E. 281	3	I.E. 100	3				
I.E. 277	3	Non-tech. elect.	3				
	18		18		16		15

Non-technical electives must satisfy requirements in both Group A and B Core Curriculum requirements.

Note: All students in industrial engineering must take the Engineer-in-Training (EIT) examination before graduation.

Curriculum in Mechanical Engineering

Degree: Bachelor of Science in Mechanical Engineering

Mechanical Engineering is a broad technical discipline which integrates basic knowledge of physics and mathematics for the design, construction and manufacture, testing, analysis, use and operation of a device, a structure, a machine, a process or a system in service to mankind. Mechanical engineering is the oldest of engineering professions. Its development parallels the growth of industry. Modern society needs mechanical engineers who have broad and deep training in the fundamentals of engineering and related sciences, and have developed a versatility in analyzing and solving complex problems. The mechanical engineer must not only possess a high level of professional expertise but also have a feel for vital human and economic considerations.

Mechanical engineers are problem solvers who are scientifically informed and mathematically minded. Graduates of the mechanical engineering curriculum find employment in a wide range of industries, government agencies, and educational institutions where they are concerned with: the use and economic conversion of energy from natural sources into useful energy for power, light, heating, cooling, and transportation; the design and production of machines to lighten the burden of human work; the planning and development of systems for using energy machines and resources; the processing of materials into products useful to mankind; and the education and training of specialists who deal with mechanical systems.

The mechanical engineering curriculum prepares students to deal effectively with a broad range of engineering problems rather than narrow specialties.

While the undergraduate curriculum is sufficiently broad to permit the graduate to select from a wide variety of employment opportunities, it contains sufficient depth to prepare a student to enter a graduate school to pursue an advanced degree. As modern science and engineering become more complex, the desirability of graduate-level preparation is being recognized by most advanced industries and government agencies.

MECHANICAL ENGINEERING

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4	Math. 17	4	Math. 18	4
Engr. 1	3	Engr. 2	3	Phys. 11	4	Phys. 12	4
Engl. 1	3	Math. 16	4	M.A.E. 30	2	M.A.E. 42	3
Math. 15	4	Core	6	M.A.E. 41	3	M.A.E. 43	3
Core	3			Engl. 2	3	Core	3
	17		17		16		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
E.E 105	4	E.E. 106	4	M.A.E. 134	3	M.A.E. 136	3
I.E. 100	3	M.A.E. 136	3	M.A.E. 182	2	Prof. elect.	6
M.A.E. 110	3	M.A.E. 141	3	M.A.E. 250	3	Core	9
M.A.E. 140	3	M.A.E. 144	3	Ch.E. 105	3		
M.A.E. 171	3	M.A.E. 180	3	Prof. elect.	3		
				Core	3		
	16		16		17		18

The professional electives (9 hr.) are selected by the student with the advice and approval of the adviser. The course selected should form a clear and consistent pattern according to the career objectives of the student. Six of the professional elective credits must be selected from courses in the department.

The 24 credit hours of Core must be selected from the University Core Curriculum with the approval of the adviser: Core A, 12 hr. and Core B, 12 hr.

All students in mechanical engineering and mechanics will be required to pass an examination on manufacturing processes and machine tools before commencing the fourth year of studies. Information on the content and nature of this examination may be obtained from the student's adviser.

Special Engineering Curricula

Elective Groups for Students in Other Colleges

All lower and upper-division courses in the College of Engineering will be open on a routine basis only to both engineering majors and those students in other colleges and schools which specify engineering courses as curriculum requirements—provided, in each case, that the students have the specified prerequisite subjects. All other categories of WVU students who wish to take engineering courses as electives *must* first obtain the permission of the chairperson of the department in which the course is offered before enrolling in the course.

Partial Curriculum

Students who do not have the time or are otherwise unable to take the full curriculum will be allowed to take a special or partial curriculum, consisting of such studies as they are prepared to take, provided such curriculum shall have been approved by the adviser.

Courses of Instruction in Engineering

Freshman Program (Engr.)

1. *Freshman Engineering Design.* 3 hr. PR or Coreq.: Math. 14. Introduction to the concepts of design (analysis, synthesis, evaluation), report writing, conservation of energy, calculation techniques, and engineering sketching. 2 hr. rec., 3 hr. lab.

2. *Freshman Engineering Design and Analysis.* 3 hr. PR or Coreq: Math. 15 or consent. Introduction to engineering profession, engineering concepts, and BASIC and FORTRAN programming with emphasis on solutions to engineering problems.

General Engineering (Engr.)

111.* *Impact of Technology on Society.* 3 hr. Designed for non-technical students to give insight into the social relevance of technology and engineering in today's culture, this course deals with the broad interface of technology and modern society, with life essentials, communication, manufacturing, etc. Attitudes of scientists, engineers, and others are compared.

191. *Special Topics.* 1-6 hr. PR or Coreq.: Junior standing; consent. Special topics in fields of general engineering, engineering analysis and design, and engineering education.

260. *Assessment of Energy Systems*. 3 hr. A comparative study of energy systems for use in meeting the energy demands of the nation. Conversion processes for utilizing fossil fuel, nuclear, geothermal, and solar sources for supplying clean fuels and energy.

Aerospace Engineering (A.E.)

(Courses are listed under Mechanical and Aerospace Engineering.)

Chemical Engineering (Ch.E.)

40. *Material and Energy Balances 1*. 3 hr. PR: Math. 15, Chem. 16. Introduction to chemical engineering fundamentals and calculation procedures, industrial stoichiometry, real gases and vapor-liquid equilibrium, heat capacities and enthalpies; material balances and energy balances. 2 hr. rec., 2 hr. calc. lab.

41. *Material and Energy Balances 2*. 3 hr. PR: Ch. E. 40. Continuation of Ch.E. 40. 2 hr. rec., 2 hr. calc. lab.

105. *Engineering Materials Science*. 3 hr. PR: Phys. 12. Includes a study of the internal structures of metals, ceramics, and organic materials, and the dependence of properties upon these structures. Also, the behavior of materials under conditions involving mechanical stresses, thermal reactions, corrosion, electromagnetic fields, and radiation. 3 hr. rec.

110. *Single and Multi-Phase Fluid Flow 1*. 3 hr. PR: Math. 17, Ch.E. 41. Fluid statics, laminar and turbulent flow phenomena, fluid friction and flow in pipes, pumps, metering and transportation of fluids, single and multiple phase flow through packed beds, settling and filtration. Laboratory demonstrations and experiments. 2 hr. rec., 3 hr. lab.

111. *Process Heat Transfer 1*. 3 hr. PR: Math. 17, Ch.E. 41. Conductive heat transfer, convective heat transfer, design and selection of heat exchange equipment, evaporation, radiation, and humidification. Applications, laboratory demonstrations, and experiments. 2 hr. rec., 3 hr. lab.

112. *Separation Processes 2*. 4 hr. PR: Ch.E. 110, 111, 246. Equilibrium stage-multiple stage operations, differential counter current contacting, air-water contact operations, drying, selection of separation processes. Laboratory demonstrations and experiments. 3 hr. rec., 2 hr. lab.

142. *Chemical Engineering Thermodynamics 1*. 4 hr. PR: Ch.E. 41, Math. 17. First and second laws of thermodynamics. Thermodynamic functions for real materials. Physical and chemical equilibrium concepts and applications. 3 hr. rec., 2 hr. lab.

145. *Chemical Engineering Transport Analysis 2*. 3 hr. PR: Ch.E. 110, 142. Development of fundamental relationships for momentum, heat and mass transfer for flow systems to include chemical reactions, interphase transport, and transient phenomena. Development and use of microscopic and macroscopic balance equations. 3 hr. rec.

170. *Chemical Plant Design 1*. 3 hr. PR: Ch.E. 112, 145. Analysis, synthesis, and design of chemical process units and systems. Professional aspects of the practice of chemical engineering. Includes a comprehensive chemical plant design project. 2 hr. rec., 3 hr. calc. lab.

171. *Chemical Plant Process Design 2*. 3 hr. PR: Ch. E. 170. Continuation of Ch.E. 170. 2 hr. rec., 3 hr. calc. lab.

172. *Chemical Reaction Engineering 1*. 3 hr. PR: Ch.E. 145, Chem. 248. Application of material balances, energy balances, chemical equilibrium relations, and chemical kinetic expressions to the design of chemical reactors. 2 hr. rec., 2 hr. lab.

175. *Chemical Process Simulation 2.* 3 hr. PR: Ch.E. 112, 145. Transient behavior of chemical process flow systems, linearization and stability. Process control system design including frequency response analysis. Analog simulation of process dynamics. 2 hr. rec., 2 hr. lab.

180. *Unit Operations Laboratory 1.* 1 hr. per sem. Conc.: Ch.E. 170. Operation of chemical process engineering equipment; collection, analysis, and evaluation of data; laboratory report preparation. 3 hr. lab.

181. *Unit Operations Laboratory 2.* 1 hr. per sem. PR: Ch.E. 180. Conc.: Ch.E. 171. Continuation of Ch.E. 180. 3 hr. lab.

190, 191. *Chemical Engineering Design Practicum.* 1 hr. per sem. Conc.: Ch.E. 170, 171. Practical application of process and equipment design methods of chemical engineering.

197. *Thesis.* 2-5 hr. Open only to qualified seniors. A problem in chemical engineering or industrial chemistry is selected for investigation. A carefully prepared report is required. 6-15 hr. lab.

224. *Process Development.* 3 hr. PR: Chem. 134, 144; Ch.E. 111, 145 or consent. Coal conversion process systems from the modified unit operations-unit process concept. Thermodynamics and kinetics in evaluation of system requirements and performance. 3 hr. rec.

231. *Mathematical Methods in Chemical Engineering.* 3 hr. PR: Math. 18. Classification and solution of mathematical problems important in chemical engineering. Treatment and interpretation of engineering data. Analytical methods for ordinary and partial differential equations including orthogonal functions and integral transforms. 3 hr. rec.

238. *Process Modeling.* 3 hr. PR: Math. 16, Ch.E. 41 or Conc.: Ch.E. 41. Analysis of engineering equations, process material balances. Computer programming—BASIC, numerical analysis. 2 hr. lec., 2 hr. lab.

251. *Metallurgical Engineering.* 3 hr. PR: Phys. 12. Principles of production of metals and alloys, plastic deformation of metals, corrosion and metal failure. 3 hr. rec. *(Course will not be offered in 1983-84.)*

253. *Ceramic Engineering 1.* 3 hr. PR: Phys. 12. Characertization of ceramic systems. Study of internal structure and structure sensitive properties; liquid and solid solutions; rheology; mechanical, thermal, chemical, optical, and electrical properties. 3 hr. rec. *(Course will not be offered in 1983-84.)*

258. *Polymers and Polymer Technology.* 3 hr. PR or Conc.: Chem. 134. Polymers and their handling. Properties of macromolecules as influenced by molecular weight, polymerization methods, plastics technology, polymer engineering. 3 hr. rec.

270. *Strategy of Process Engineering.* 3 hr. PR: Ch.E. 111 or consent. Latest theories of process design and process optimization, proven through regular use by practicing engineers, are applied to the major problems of process engineering. 3 hr. rec. *(Course will not be offered in 1983-84.)*

280. *Chemical Engineering Problems.* 1-6 hr. For juniors, seniors, and graduate students. May be used to correct deficiencies before or following courses such as Ch.E. 170 and 171, or for other students desiring to take only a portion of a course.

290. *Introduction to Nuclear Engineering.* 3 hr. PR: Junior standing. Introduction to fundamental principles and applications of nuclear technology in science and engineering fields. Studies of nuclear fission and the design and operation of nuclear reactor systems; uses of radioisotopes as power sources and in materials processing, testing and medicine; health physics and radiation detection and shielding.

301. *Transport Phenomena.* 3 hr. PR or Conc.: Ch.E. 231 or equiv. Introduction to the equations of change (heat, mass and momentum transfer) with a differential balance approach. Use in Newtonian flow, turbulent flow, mass and energy transfer, radiation, convection. Estimation of transport coefficients. 3 hr. rec.

307. *Distillation.* 2-5 hr. PR: Math. 18 and consent. Vaporization principles of separation of liquid mixtures, steam, batch, continuous, azeotropic, extractive, and molecular distillation. 3 hr. rec., 0-6 hr. lab. *(Course will not be offered in 1983-84.)*

323. *Advanced Process Development.* 3 hr. PR: Consent. Extended and generalized unit process and operation concepts; specialized process synthetic methods; reaction mechanisms and their effects on equipment design and performance; material properties, their evaluation, prediction and marketability; evaluation of process. 3 hr. rec.

330. *Process Dynamics and Control.* 3 hr. PR: Consent. Dynamic response of processes and control instruments. Use of Laplace transforms and frequency response methods in analysis of control systems. Application of control systems in chemical reactors, distillation, and heat transfer operations. Introduction to nonlinear systems. 3 hr. rec.

344. *Thermodynamics.* 3 hr. PR: Consent. Logical development of thermodynamic principles. These are applied to selected topics including development and application of the phase rule, physical and chemical equilibria in complex systems and non-ideal solutions. Introduction to non-equilibrium thermodynamics. 3 hr. rec.

345. *Chemical Reaction Engineering 2.* 3 hr. PR: Consent. Homogeneous reactions, batch and flow reactors, ideal reactors, macro and micro mixing, non-ideal flow reactors, heterogeneous reaction systems, catalytic and non-cataloyic reactions, reactor stability analysis, reactor optimization. 3 hr. rec.

358. *Polymer Processing.* 3 hr. PR: Chem. 134 or consent. Analytical description of rheology, molding, extrusion, bonding, polymer modification operations, and physical properties. 3 hr. rec.

370. *Process Equipment Design 1.* 3 hr. PR: Ch.E. 301 or consent. Design, sizing, optimization, and cost estimation of equipment used for heat transfer, emphasis on design techniques, computer design techniques discussed where applicable. 3 hr. rec.

371. *Process Equipment Design 2.* 3 hr. PR: Ch.E. 301 or consent. Design and selection of separation processes including crystallization, leaching, extraction, distillation, adsorption, filtration, membrane, and diffusional separation processes. Similarities between separation processes based on mode of operation are emphasized. 3 hr. rec.

390. *Nuclear Reactor Systems 1.* 3 hr. PR: Consent. Intended as a first course for graduate students in the area of power reactor systems analysis and design. Includes topics such as neutron interactions with reactor materials, fission, reactor physics, reactor heat generation and removal, and thermal reactor core design. *(Course will not be offered in 1983-84.)*

391. *Nuclear Reactor Systems 2.* 3 hr. PR: Ch.E. 390. Continuation of Ch.E. 390. Reactor kinetics, nuclear power economics, and case studies and analysis of the following reactor systems: pressurized-water, boiling water, fast breeder, and gas-cooled power plants. *(Course will not be offered in 1983-84.)*

392. *Interaction of Radiation and Matter.* 1-3 hr. PR: Consent. Types of radiation, energy deposition by radiation, experimental instrumentation, formation and reactions of radiation-chemical species. 1-3 hr. rec. *(Course will not be offered in 1983-84.)*

Civil Engineering (C.E.)

1.* *Surveying.* 2 hr. PR: Math. 4. Elementary theory and practice of the measurement of distance, angles, and difference in elevation. Office computation and plotting. 1 hr. rec., 3 hr. lab.

5.* *Land Surveying.* 4 hr. PR: Math. 4. Theory and practice with compass, transit, level, and stadia. Computations of area, earthwork volumes, and horizontal and vertical curves; astronomical observations; boundary surveying; and map plotting. 2 hr. rec., 6 hr. lab.

6.* *Topographic Mapping.* 2 hr. PR: C.E. 5. Plotting methods, materials, accuracy standards, and reproduction methods for large scale topographic maps. Determination of road location, outcrop lines, and volumes from topographic maps. Practice in plane table surveying, lettering, plotting, and inking of topographic maps. 1 hr. rec., 3 hr. lab.

90. *Introduction to Civil Engineering.* 2 hr. PR: Sophomore or junior standing. Historical foundations of civil engineering and the role of the profession. Basic disciplines within civil engineering are discussed. Process of integrating the digital computer into service for the civil engineer discussed. 1 hr. lec., 3 hr. rec. and lab.

101. *Survey Engineering.* 4 hr. PR: C.E. 90 or consent. Theory of measurements and errors, traverse computations, meridan determination, state plane coordinates, horizontal and vertical curves, easement curves, earthwork volumes, topographic mapping, construction surveying, and boundary surveying. 3 hr. rec., 3 hr. lab.

110. *Civil Engineering Materials.* 4 hr. PR: M.A.E. 43 and C.E. 90 or consent. Physical, chemical, and molecular properties of materials commonly employed in civil engineering works. Influence of these properties on the performance and use of materials. Emphasis on laboratory evaluation of properties that control the performance of materials. 3 hr. rec., 3 hr. lab.

120. *Fluid Mechanics and Hydraulics.* 4 hr. PR: M.A.E. 41; PR or Conc.: M.A.E. 42. Fluid statics, kinematics and dynamics of fluid flow, flow measurements, flow in pressure conducts and open channels, similtude and dimensional analysis, and applications of turbomachines. 3 hr. rec., 3 hr. lab.

132. *Introduction to Transportation Engineering.* 4 hr. PR: C.E. 101. Integrated transportation systems from the standpoint of assembly, haul, and distribution means. Analysis of transport equipment and traveled way. Power requirements, speed, stopping, capacity, economics, route location. Future technological developments and innovations. 3 hr. rec., 3 hr. lab.

146. *Sanitary Engineering 1.* 3 hr. PR: C.E. 120. Population prediction and hydrology as applied to the design of water storage reservoirs and the design of water distribution, wastewater, and stormwater collection systems. 2 hr. rec., 3 hr. lab.

147. *Sanitary Engineering 2.* 3 hr. PR: Junior standing. Examination of water and wastewater, analysis and design of water and wastewater treatment systems including treatment and disposal of residuals. 2 hr. rec., 3 hr. lab.

160. *Structural Analysis 1.* 3 hr. PR: M.A.E. 41 and C.E. 90 or consent. Stability and determinacy of structures; shear and bending moment diagrams of determinate beams and frames; analysis of trusses; determination of displacements of planar structures by geometric and energy methods. 3 hr. rec.

169. *Introduction to Structural Design.* 3 hr. PR: C.E. 110, 160. Structural design in steel, reinforced concrete, and timber for axially loaded members, members in bending and members subjected to axial load and bending. 3 hr. rec.

*May be taken as undergraduate work by students in other colleges and schools.

180. *Soil Mechanics.* 4 hr. PR: C.E. 110. Origin and distributions of soils, classification of soils, fundamental soil properties, and stresses in soils. Subsurface exploration. Analysis and design of foundation and retaining wall systems. 3 hr. rec., 3 hr. lab.

195. *Seminar.* (Credit.) PR: Junior or senior standing. Lectures by noted engineering and engineering-related practitioners and educators. Discussion of matters of mutual concern to students and faculty.

196. *Professional Development.* 1 hr. *(May be repeated four times.)* PR: Junior standing. The presentation of selected seminars, minicourses, and workshops on topics related to the planning, design, construction, and management of civil engineering systems.

201. *Principles of Boundary Surveying.* 3 hr. PR: C.E. 101 or consent. A study of the retracement requirements for metes and bounds survey systems. The study will include interpretation and writing of the property descriptions, legal principles related to boundary establishment, and analytical approaches to boundary location. 3 hr. rec.

212. *Concrete and Aggregates.* 3 hr. PR: C.E. 110 or consent. Considerations and methods for the design of concrete mixes. Properties of portland cement and aggregates and their influence on the design and performance of concrete mixtures. Testing of concrete and aggregate and the significance of these tests. 2 hr. rec., 3 hr. lab.

213. *Construction Methods.* 3 hr. PR: Junior or senior standing in civil engineering. Study of construction methods, equipment, and administration with particular emphasis on the influence of new developments in technology. 3 hr. rec.

222. *Open Channel Flow.* 3 hr. PR: C.E. 120. Hydraulic problems associated with natural waterways, man-made waterways, and design of hydraulic structures of open channels. 3 hr. rec.

231. *Highway Engineering.* 3 hr. PR: C.E. 132, 180. Highway administration, economics and finance; planning and design; subgrade soils and drainage; construction and maintenance. Design of a highway. Center line and grade line projections, earthwork and cost estimate. 2 hr. rec., 3 hr. lab.

233. *Urban Transportation Planning and Design.* 3 hr. PR: C.E. 132 or consent. Principles of planning and physical design of transportation systems for different parts of the urban area. Land use, social, economic, and environmental compatibilities are emphasized. Evaluation and impact assessment.

235. *Railway Engineering.* 3 hr. PR: C.E. 101. Development and importance of the railroad industry. Location, construction, operation, and maintenance. 3 hr. rec.

240. *Applied Hydrology.* 3 hr. PR: Consent. The hydrologic cycle with emphasis on precipitation and runofff as related to design of hydraulic structures, soil and water conservation, and flood control. 3 hr. rec.

245. *Properties of Air Pollutants.* 3 hr. PR: Consent. Physical, chemical, and biological behavioral properties of dusts, droplets, and gases in the atmosphere. Air pollutant sampling and analysis. Planning and operating air pollution surveys. 2 hr. rec., 3 hr. lab.

251. *Public Health Engineering.* 3 hr. PR: C.E. 146 or 147 or consent. Engineering aspects involved in control of the environment for protection of health and promotion of comfort of man. Communicable disease control, milk and food sanitation, air pollution, refuse disposal, industrial hygiene, and radiological health hazards. 3 hr. rec.

252. *Water Resources Engineering.* 3 hr. PR: C.E. 120. Application of hydrologic and hydraulic principles in the design and analysis of water resources systems. Topics include hydraulic structures, economics and water law irrigation, hydroelectric power, navigation, flood-drainage litigation, and water-resources planning. 3 hr. rec.

260. *Structural Analysis 2.* 3 hr. PR: C.E. 160. Fundamental theory of statically indeterminate structures. Analysis of indeterminate beams, frames, and trusses by stiffness and flexibility methods; computer aided structural analysis by standard computer codes; study of influence lines for beams, frames, and trusses. 3 hr. rec.

270. *Reinforced Concrete Design.* 3 hr. PR: C.E. 110, 160. Behavior and design of reinforced concrete members. Material properties; design methods and safety considerations; flexure; shear; bond and anchorage; combined flexure and axial load; footings; introduction to torsion, slender columns, and prestressed concrete. 2 hr. rec., 3 hr. lab.

271. *Steel Design.* 3 hr. PR: C.E. 260. Design of steel bridge and building systems with emphasis on connections, beams, columns, plastic design, and cost estimates. 2 hr. rec., 3 hr. lab.

274. *Timber Design.* 3 hr. PR: C.E. 260. Fundamentals of modern timber design and analysis. Topics include wood properties, design of beams, columns, trusses, and pole structures using dimension lumber, glue-laminated products, and plywood. 2 hr. rec., 3 hr. lab.

281. *Foundations Engineering.* 3 hr. PR: C.E. 180. Soils exploration and the design and analysis of engineering foundations. Emphasis on earth pressures and design of retaining walls, studies of bracing systems, and the elements of shallow and deep foundations for bridges and buildings. 3 hr. rec.

290. *Civil Engineering Problems.* 1-6 hr. PR: Junior or senior standing. Special topics in various aspects of civil engineering analysis, design, and construction.

291. *Comprehensive Project for Civil Engineering.* 3 hr. PR: Senior standing in civil engineering. Application of civil engineering principles, through group studies, to develop a solution for a comprehensive engineering problem. Consideration given to a problem involving all aspects of civil engineering. 1 hr. rec:, 6 hr. lab.

293. *Basic Finite Element Methods.* 3 hr. PR: Senior standing or consent. Simplified treatment of theoretical basis of finite element method, background theory, formulation and applications: stress analysis in axial columns, one-dimensional heat and fluid flow, consolidation, beam-column analysis, mass transportation and overland flow.

296. *Civil Engineering Studies.* 1-3 hr. *(Only 3 hr. credit may be applied toward the B.S.C.E. degree.)* PR: Consent. Supervised internships and field experience in civil engineering analysis, design, and construction.

307. *Photogrammetry.* 3 hr. PR: C.E. 101. Geometry and interpretation of aerial photography; flight planning; radial-line control; principles of stereoscopy; plotting instruments. 2 hr. rec., 3 hr. lab.

308. *Geodesy.* 3 hr. PR: C.E. 101. Precise base line measurements, triangulation and leveling, geodetic astronomy; figure of the earth, map projections; rectangular coordinate systems; least squares adjustment; gravity. 3 hr. rec.

310. *Bituminous Materials and Mixtures.* 3 hr. PR: C.E. 110 or consent. Manufacture, testing, and nature of bituminous mixtures including the influence of aggregates, temperature, and other variables on mix design. Significance of test methods and specifications. Construction practice. 2 hr. rec., 3 hr. lab.

311. *Pavement Design.* 3 hr. PR: C.E. 110, 180. Effects of traffic, soil, environment, and loads on the design and behavior of pavement systems. Design of pavement systems. Consideration of drainage and climate. Pavement performance and performance surveys. 3 hr. rec.

323. *Airport Planning and Design.* 3 hr. PR: C.E. 132 or consent. Financing, air travel demand modeling, aircraft trends, traffic control, site selection, ground access, noise control, geometric design, pavement design, terminal facilities. 3 hr. rec.

333. *Geometric Design of Highways*. 3 hr. PR: Consent. The theory and practice of geometric design of modern highways. Horizontal and vertical alignment, cross-slope, design speed, sight distances, interchanges, and intersections. Critical analysis of design specifications. 2 hr. rec., 3 hr. lab.

334. *Introduction to Traffic Engineering*. 3 hr. PR: C.E. 132 or consent. The purpose, scope, and methods of traffic engineering. Emphasis on the three basic elements of each element and interactions between the elements. Laboratory devoted to conducting simple traffic studies, solving practical problems, and designing traffic facilities. 2 hr. rec., 3 hr. lab.

349. *Solid Waste Disposal*. 3 hr. PR: Consent. Patterns and problems of solid waste storage, transport, and disposal. Examination of various engineering alternatives with appropriate consideration for air and water pollution control and land reclamation. Analytical approaches to recovery and reuse of materials. 2 hr. rec., 3 hr. lab.

350. *Sanitary Chemistry and Biology*. 3 hr. PR: C.E. 147 or consent. Study of physical and chemical properties of water. Theory and methods of chemical analysis of water, sewage, and industrial wastes. Biological aspects of stream pollution problems. 2 hr. rec., 3 hr. lab.

356. *Principles of Biological Waste Treatment*. 3 hr. PR: C.E. 350 or consent. Examination of biological treatment systems related to microbiology and function. Models used to describe system behavior and kinetics are developed. Laboratory and field experiments are performed to understand the relation between operation and design. 2 hr. rec., 3 hr. lab.

359. *Basic Radiological Health*. 3 hr. PR: Consent. Fundamental theory and terminology. Environmental and occupational hazards in the nuclear field. Radioactive waste disposal. Laboratory measurements of radioactivity. 3 hr. rec.

361. *Statically Indeterminate Structures*. 3 hr. PR: C.E. 260 or consent. Force and displacement methods of analysis; energy principles and their application to trusses, frames, and grids; effects of axial forces; influence lines for frames, arches, and trusses; secondary stress analysis. 3 hr. rec.

363. *Introduction to Structural Dynamics*. 3 hr. PR: C.E. 361 or 460. General theory for dynamic response of systems having one or several degrees of freedom. Emphasis on the application of dynamic response theory to structural design. 3 hr. rec.

372. *Plastic Design of Steel Structures*. 3 hr. PR: C.E. 260, 271 or consent. Fundamental concepts of inelastic behavior in steel. Analysis of structures for ultimate load. Influence of axial forces, shear forces, and local buckling on the plastic moment. Study of structural connections and deflections. Steel structures design. 3 hr. rec.

373. *Prestressed Concrete*. 3 hr. PR: C.E. 260, 270 or consent. Behavior and design of prestressed concrete members. Materials, bending, shear, torsion, methods of prestressing, prestress losses, deflections, compression members, composite members, indeterminate structures. 3 hr. rec.

380. *Soil Properties and Behavior*. 3 hr. PR: C.E. 180 or consent. Soil mineralogy and the physico-chemical properties of soils and their application to an understanding of permeability, consolidation, shear strength, and compaction. Prediction of engineering behavior of soils in light of physico-chemical concepts. 3 hr. rec.

381. *Soil Testing*. 3 hr. PR: C.E. 180 or consent. Experimental evaluation of soil properties and behavior. Emphasis is placed on the proper interpretation of experimental results and application of such results to practical problems. 1 hr. rec., 6 hr. lab.

385. *Airphoto Interpretation*. 3 hr. Study of techniques for obtaining qualitative information concerning type and engineering characteristics of surficial materials. Use of airphoto interpretation for evaluation of engineering problems encountered in design and location of engineering facilities. 3 hr. rec.

393. *Advanced Finite Element Methods.* 3 hr. PR: C.E. 293, or consent. Formulation procedures and applications of finite element methods to two-, three-dimensional problems, techniques for nonlinear analysis, computer implementation; applications in field problems, flow, and dynamics.

Electrical Engineering (E.E.)

21.* *Introduction to Electrical Engineering.* 3 hr. PR: Engr. 2, Math. 16, Phys. 12 (or Coreq.). Electrical engineering units, circuit elements, circuit laws, measurement principles, mesh and node equations, network theorems, energy storage elements, RC & RL circuits, unit step response, second order circuits, sinusoids and phasors and introduction to network theory. 3 hr. rec.

22.* *Introduction to Electrical Engineering Laboratory.* 1 hr. Coreq.: E.E. 21. Laboratory experiments in measurement of electrical quantities and circuit parameters. Use of the digital computer to solve circuit problems. 3 hr. lab.

24.* *Electrical Circuits.* 3 hr. PR: E.E. 21, E.E. 22, Math. 18 (or Coreq.). Introduction to network analysis. Sinusoidal (AC) steady state, average and RMS values, polyphase systems, complex frequency, network frequency response, two port networks and transformers, Fourier methods and Laplace Transforms. 3 hr. rec.

25.* *Electrical Circuits Laboratory.* 1 hr. Coreq.: E.E. 24. Laboratory experiments in measurement of electrical circuit behavior and parameters. Use of digital computer to solve circuit problems. 3 hr. lab.

71.* *Introduction to Digital Logic Design.* 3 hr. Coreq.: E.E. 21, 22. An introduction to the design of digital networks and computers. Topics include number systems, coding, Boolean and switching algebra, logic design, minimization of logic, sequential networks and design of digital subsystems. 3 hr. rec.

101.* *Introduction to Electrical Power Devices and Systems.* 3 hr. PR: Junior or senior standing in engineering (not open to Electrical Engineering majors). Fundamental principles of electric and magnetic properties. DC and AC circuits. Application to single- and three-phase systems, motor control, circuit protection, safety. 3 hr. rec.

102.* *Basic Electrical Laboratory.* 1 hr. Coreq: E.E. 101. Laboratory experiments in measurement of electrical quantities and circuit parameters. 3 hr. lab.

103.* *Introduction to Electronic Instrumentation.* 3 hr. PR: Junior or senior standing in engineering (Not open to Electrical Engineering majors). Electrical fundamentals, analog and digital devices and circuits, communication and telemetry, measurement instruments and techniques. 3 hr. rec.

104.* *Instrumentation Laboratory.* 1 hr. Coreq.: E.E. 103. Laboratory experiments demonstrating the characteristics of electron devices and the performance of digital and analog instrumentation and control systems. 3 hr. lab.

124.* *Signals and Systems 1.* 3 hr. PR: Math. 18, E.E. 24, 71. Introduction to linear systems models and solutions in the time and frequency domains. Balanced emphasis is placed on both continuous and discrete time and frequency methods. 3 hr. rec.

126.* *Signals and Systems 2.* 3 hr. PR: E.E. 124. Statistical description of nondeterministic signals, correlation functions and spectral density. Sampling theory, filtering random signals and noise. Modulation techniques, AM/FM/TV transmitters/receivers. Concepts applied to various communication and feedback systems. 3 hr. rec.

127.* *Signals and Systems 1 Laboratory.* 1 hr. Coreq.: E.E. 124. Laboratory experiments in measurement of electrical system and signal parameters. 3 hr. lab.

*May be taken as undergraduate work by students in other colleges and schools.

130. *Electromechanical Energy Conversion.* 3 hr. PR: E.E. 124, 127, 140. Fundamentals of electromechanical energy conversion, transformers and rotating machinery. 3 hr. rec.

131. *Introduction to Power Systems.* 3 hr. PR: E.E. 130, 135. Analysis of power system elements connected together as an integrated system for the transmission and distribution of electric power. Load flow, symmetrical components. 3 hr. rec.

135. *Energy Conversion Laboratory.* 1 hr. Coreq: E.E. 130. DC motor and generator performance and characteristics, single-phase transformer, AC machines, synchronous machine and induction motor performances and characteristics. 3 hr. lab.

136. *Power Systems Laboratory.* 1 hr. Coreq.: E.E. 131. The power system simulator is used for experiments dealing with generation, transmission, distribution, and protection. The aspect of interconnection with other systems is explored. 3 hr. lab.

140.* *Electric and Magnetic Fields 1.* 3 hr. PR: Math. 18, Phys. 12. Introduction to vector analysis, orthogonal coordinate systems, Maxwell's equations, scalar and vector potentials, electric and magnetic static fields, boundary-value problems, Laplace's and Poisson's equation, electromagnetic static fields. 3 hr. rec.

141. *Electric and Magnetic Fields 2.* 3 hr. PR: E.E. 140. Plane waves in lossless and dissipative media, polarization, reflection and refraction of plane waves, lossless and dissipative transmission lines, waveguides, radiation and antennas. 3 hr. rec.

151. *Electronic Properties of Materials.* 3 hr. PR: E.E. 24, 25, Phys. 12, Math. 18. Physical principles of electric charge transport in solids and gases. Application of these principles to the study of junction diodes and bipolar and field-effect transistors, their terminal characteristics and circuit behavior. 4 hr. rec.

156. *Digital Electronics.* 2 hr. PR: E.E. 124, 127, 151. Description of electronic logic gates and their use in implementing combinational expressions, arithmetic units, registers and counters. Special emphasis is placed on logic levels, circuit configuration, interfacing and A/D-D/A conversion. 2 hr. rec.

157. *Digital Electronics Laboratory.* 1 hr. Coreq.: E.E. 156. Design, fabrication, and measurement of digital electronic circuits. Use of discrete devices, integrated logic, display devices, and timer circuits. Study of A/D and D/A circuits and interfaces. 3 hr. lab.

158. *Analog Electronics.* 3 hr. PR: E.E. 124, 127, 151. Electronic devices in analog circuits. Small-signal and graphical analysis of BJT and FET circuits; frequency response, feedback, and stability. Linear and nonlinear operational amplifier circuits. Power amplifiers and power control by electronic devices. 3 hr. rec.

159. *Analog Electronics Laboratory.* 1 hr. Coreq.: E.E. 158. Design, fabrication, and measurement of analog electronic circuits. Use of discrete devices, integrated circuits, operational amplifiers, and power electronic devices. Study of biasing and stability, frequency response, filters, analog computation circuits, and power control circuits. 3 hr. lab.

180. *Senior Design Seminar.* 1 hr. PR: E.E. 156 or E.E. 158 or consent. Seminar on selected topics leading to the selection of a project for E.E. 181. Other topics include professional development, legal and ethical aspects of engineering. 1 hr. rec.

181. *Senior Design Project.* 3 hr. PR: E.E. 130, 156, 158, E.E. 180 or consent. The application of engineering analysis, principles, and practical consideration to the design and execution of an electrical engineering project. Emphasis is placed on the professional approach of the analysis and solution of an engineering problem. 3 hr. rec.

*May be taken as undergraduate work by students in other colleges and schools.

208. *Power Electronics*. 3 hr. PR: E.E. 130 and E.E. 158, 159 (concurrently) or consent. Application of power semiconductor components and devices to power system problems; power control, conditioning processing, and switching. Course supplemented by laboratory problems. 3 hr. rec.

216. *Fundamentals of Control Systems*. 3 hr. PR: E.E. 124, 127. Introduction to classical and modern control; signal flow graphs; state-variable characterization; time-domain, root-locus, and frequency techniques; stability criteria. 3 hr. rec.

230. *Electrical Power Distribution Systems*. 3 hr. PR: E.E. 131, 136 or consent. General considerations; load characteristics; subtransmission and distribution substations; primary and secondary distribution, secondary network systems; distribution transformers; voltage regulation and application of capacitors; voltage fluctuations; protective device coordination. 3 hr. rec.

231. *Power Systems Analysis*. 3 hr. PR: E.E. 131, 136 or consent. Incidence and network matrices, Y-Bus, symmetrical and unsymmetrical faults, load-flow and economic dispatch, MW-frequency and MVAR-voltage control. The power system simulator will be used for demonstrations. 3 hr. rec.

234. *Power System Control and Stability*. 3 hr. PR: E.E. 131, 136 or consent. Synchronous machine equations and equivalent circuit, swing equation, classical model, small disturbance, machine-infinite bus, damping and synchronizing torques, linear model. The power system simulator will be used for demonstrations. 3 hr. rec.

244. *Introduction to Antennas and Radiating Systems*. 3 hr. PR: E.E. 141 or consent. Fundamentals, parameters, radiation integrals, linear antennas, far-field approximations, loop antennas, arrays and continuous distributions, mutual impedance, broadband dipoles and matching techniques, traveling wave and broadband antennas, frequency independent antennas, and aperture antennas. 3 hr. rec.

245. *Microwave Circuits and Devices*. 3 hr. PR: E.E. 141. UHF transmission line theory, impedance matching techniques and charts, general circuit theory of one port and multiports for waveguiding systems, impedance and scattering matrices, waveguide circuit elements, microwave energy sources. Course will be supplemented by laboratory problems. 3 hr. rec.

246. *Radar and RF Systems Engineering*. 3 hr. PR: E.E. 126, 141, 158, 159. An introduction to radar system fundamentals and techniques, including a discussion of modulation and detection theory, RF amplifiers, mixers, antennas, and propagation effects. Application of probability and statistics to signal processing and detection in noise. 3 hr. rec.

251. *Noise and Grounding of Electronic Systems*. 1 hr. PR: E.E. 158, 159 or consent. Description of extrinsic and intrinsic noise. Techniques for noise reduction in electronic circuits. 1 hr. rec.

252. *Electronics 3*. 3 hr. PR: E.E. 158, 159. Linear integrated circuit building blocks applied to such functions as amplification, controlled frequency response, analog-digital conversion, sampling, and waveform generation. 2 hr. rec., 3 hr. lab.

253. *Physical Electronics 1*. 3 hr. PR: E.E. 151 or equiv. Properties of semiconductors and electrical conduction processes in solids. Determining the characteristics of discrete electronic devices. Introduction to masers and lasers. 3 hr. rec.

257. *Transistor Circuits*. 3 hr. PR: E.E. 158, 159 or equiv. Analysis and design of subcircuits used in analog integrated circuit modules. Transistor models, low-frequency response of multistage amplifiers, current sources, output stages and active loads. 3 hr. rec.

259. *Solid State RF Engineering*. 3 hr. PR: E.E. 124, 141, 156, 158, or corequisite. Analysis and design of electronic circuitry for RF telecommunications systems. Treatment of electrical noise, RF amplifiers, oscillators and mixers. Applications to AM/FM/TV. Receiver and transmitter technology for HF/VHF/UHF and satellite communication. 3 hr. rec.

264. *Introduction to Communications Systems*. 3 hr. PR: E.E. 126. Introduction to the first principles of communications systems design. Analysis and comparison of standard analog and pulse modulation techniques relative to bandwidth, noise, threshold, and hardware constraints. Communications systems treated as opposed to individual circuits and components of the system. 3 hr. rec.

268. *Digital Signal Processing Fundamentals*. 3 hr. PR: E.E. 126, 156, 157. Theories, techniques, and procedure used in analysis, design, and implementation of digital and sampled data filters. Algorithms and computer programming for software realization. Digital and sampled data realizations, switched capacitor and charge coupled device IC's. 3 hr. rec.

271. *Logic of Digital Computers*. 3 hr. PR: Consent. (Junior standing in electrical engineering.) An introduction to the design of digital networks and computers. Topics include: computer organization, numbering systems and representatives, Boolean or switching algebra, logic design, minimization of logic, sequential networks, and design of digital subsystems. 3 hr. rec.

272. *Introduction to Computer Hardware Architecture*. 3 hr. PR: Consent. Introduction to the basic digital systems and computer architecture. Definition of information storage concepts, central processor designs, and input/output concepts. Content addressable memories, microprogrammed control, addressing techniques, interrupts, and cycle stealing. 3 hr. rec.

274. *Introduction to Microprocessor Based Design*. 3 hr. PR: E.E. 271 or consent. Microprocessor terminology and system design. A systems approach is taken to individual student designs of microprocessor systems. A "hands-on" electronic development approach is taken using state-of-the-art computer technology. 3 hr. rec.

275. *Microprocessor Interfacing Techniques*. 3 hr. PR: E.E. 274. Interfacing components and methods are analyzed in terms of their applications and electronics requirements. Includes driver/ receiver circuits, high power interface devices, A/D D/A interfacing, timing margins, serial/parallel communications, interrupt-driven and direct memory access. *(A working microprocessor is required.)* 3 hr. rec.

278.* *Analogue Computers*. 3 hr. PR: Math. 18. The theory and operation of analogue computers. Amplitude scaling and time scaling on the computer and application of computer to solution of differential equations. 3 hr. rec.

280. *Electrical Problems 1*. 1-3 hr. PR: Junior, senior, or graduate standing.

281. *Biomedical Electrical Measurements*. 2 hr. PR: Junior standing. Biomedical instrumentation for human subjects. Origin and characteristics of biological electrical signals. Instrument design requirements and detailed analysis of cardiac support and intensive care monitoring equipment. 2 hr. rec.

312. *Feedback System Theory*. 3 hr. PR: E.E. 216, 325. Signal flow graphs; sensitivity; return difference; mathematical definition of feedback; effects of feedback; multiple loop systems; multivariate systems. 3 hr. rec.

315. *State Variable Analysis of Systems*. 3 hr. PR: Consent. Matrix theory and linear transformations as applied to linear control systems. The state-space on time-domain study of stability, controllability, observability, etc. 3 hr. rec.

*May be taken as undergraduate work by students in other colleges and schools.

316. *Synthesis of Feedback Systems 1.* 3 hr. PR: E.E. 312, 364. Methods of direct synthesis and optimization of feedback systems; Wiener theory; Pontryagin's maximum principles; dynamic programming; adaptive feedback systems. 3 hr. rec.

325. *Advanced Linear Circuit Analysis.* 3 hr. PR: Consent. Systematic formulation of circuit equations. Use of operational techniques to find total solutions. Applications and characteristics of the Laplace and Fourier transforms. Matrix algebra, complex variable theory and state variables are made to circuit analysis and elementary circuit synthesis. 3 hr. rec.

328. *Modern Network Synthesis.* 3 hr. PR: E.E. 325 or consent. Two-terminal network synthesis; Brune and Bott-Duffin syntheses; four-terminal networks; modern filter synthesis; Darlington synthesis; transfer-function synthesis; ladder and lattice synthesis; potential analogy and approximation. 3 hr. rec.

330. *Advanced Electrical Machinery.* 3 hr. PR: E.E. 131, 136 or consent. Theory and modeling of synchronous, induction, and dc machines; their steady-state and transient analysis. 3 hr. rec.

331. *Electrical Power Systems 2.* 3 hr. PR: E.E. 231 or consent. Electrical transients on power systems including traveling waves due to lightning and switching. Principles of lightning protection. 3 hr. rec.

333. *Application of Digital Computers to Power System Analysis 1.* 3 hr. PR: E.E. 231 or consent. Incidence and network matrices; algorithms for their formulation; three-phase networks; short-circuit calculations; load-flow studies. 3 hr. rec.

340. *Electromagnetic Fields and Guided Waves 1.* 3 hr. PR: E.E. 141 or equiv. Plane waves in dielectrics, conducting, and anisotropic media; polarization; radiation; duality; uniqueness; image theory; equivalence principle; Green's functions; integral equations; plane wave functions. 3 hr. rec.

344. *Advanced Antenna Theory.* 3 hr. PR: E.E. 244 or equiv. Aperture antennas; geometrical theory of diffraction, horns; reflectors and lens antennas; antenna synthesis and continuous sources; moment method; Fourier transform methods; antenna measurements. 3 hr. rec.

350. *Electronic Circuits.* 3 hr. PR: E.E. 157, 158 or equiv. Analysis and design of electronic circuits; low-pass and band-pass amplifiers, single-tuned and double-tuned stages, equal ripple and maximally flat responses. 3 hr. rec.

353. *Physical Electronics 2.* 3 hr. PR: E.E. 157, 158 or equiv. Semiconductor surfaces; surface states, space charge and the field effect. 3 hr. rec.

357. *Linear Integrated Circuits.* 3 hr. PR: E.E. 157, 158 or equiv. Techniques of integrated circuit design and fabrication. Development of models descriptive of linear and nonlinear transistor operation. Design and analysis of high frequency tuned, dc, and differential amplifiers. Primarily for students specializing in communication and electronics. 3 hr. rec.

358. *Integrated Logic Circuits.* 3 hr. PR: E.E. 157, 158 or equiv. or consent. Techniques of integrated circuit design and fabrication. Development of transistor model for nonlinear operation. Design, analysis, and comparison of emitter-coupled, direct-coupled, diode-transistor, and transistor-transistor integrated logic circuits. Intended for students specializing in digital circuits. 3 hr. rec.

364. *Communication Theory.* 3 hr. PR: E.E. 264 or consent. Detailed study of probability theory and its use in describing random variables and stochastic processes. Emphasis on applications to problems in communication system design. 3 hr. rec.

366. *Information Theory 1.* 3 hr. PR: E.E. 364. Probability concepts; theory of discrete systems; encoding; theory of continuous systems with memory; the fundamental theorem of information theory. 3 hr. rec.

370. *Switching Circuit Theory 1.* 3 hr. PR: E.E. 271 or equiv. Course presumes an understanding of the elements of Boolean or switching algebra. Study of both combinational and sequential switching circuits with emphasis on sequential networks. Advanced manual design and computer-aided design techniques for single and multiple output combinational circuits. Analysis and design of sequential circuits. Detection and prevention of undesired transient outputs. 3 hr. rec.

372. *Advanced Computer Architecture.* 3 hr. PR: E.E. 271 and 272 or consent. Formal tools for designing large digital systems are introduced; formal descriptive algebras such as ISP, PMS, AHPL, CDL, and others. An in-depth study of computer system designs including instruction design and data path design. 3 hr. rec.

373. *Design of Computer Arithmetic Circuits 1.* 3 hr. PR: E.E. 271 or equiv. Detailed study of computer circuitry usable in performing binary arithmetic. Logic, circuitry, and engineering aspects of digital computer equipment design. Primary emphasis on design of high speed, parallel arithmetic units using the natural binary number system. Analysis of systems for representing negative numbers. Study of various means for obtaining high speed addition, subtraction, and multiplication. 3 hr. rec.

374. *Design of Computer Arithmetic Circuits 2.* 3 hr. PR: E.E. 373. Continuation of E.E. 373. High speed binary division, floating point arithmetic, modular or residue arithmetic, and techniques for checking arithmetic are covered. Recent innovations studied as literature becomes available. 3 hr. rec.

390. *Advanced Independent Study.* 1-6 hr. PR: Consent. Individual investigation in advanced electrical engineering subjects not covered in formal courses.

Industrial Engineering (I.E.)

20. *Fundamentals of Industrial Engineering.* 1 hr. PR: Sophomore standing. An introduction to the basic principles of industrial engineering.

100. *Manufacturing Processes.* 3 hr. PR or Conc.: M.A.E. 43. Lectures, demonstrations, and laboratory work relating to methods, equipment, and character of machining, casting, joining, and forming operations. Engineering and economic analysis of the processes. 2 hr. lec., 3 hr. lab.

113. *Engineering Statistics.* 3 hr. PR: Math. 16. The use of statistical analysis in engineering decision making. Topics covered include basic statistical methods of describing data, common statistical distributions encountered in engineering, test of hypotheses, confidence intervals, and simple linear regression.

140. *Motion and Time Study.* 3 hr. PR: Sophomore standing. Principles and techniques, job analysis, standardization, and formula construction; stop watch and micromotion analysis of industrial operations; development of production and incentive standards. Human factors. 2 hr. lec., 3 hr. lab.

170. *Accounting for Engineers.* 3 hr. PR: Sophomore standing. The accounting cycle, journals, and ledgers; fixed assets and depreciation; financial statements. Essentials of cost accounting. Emphasis on utilization of cost data and reports by management, indicating management's control over industrial operations.

201. *Principles of Solidification.* 3 hr. Material and energy balances, solidification of metals, riser and gating systems for castings, fluidity of metal, casting design, and molding processes.

214. *Analysis of Engineering Data.* 3 hr. PR: I.E. 113. Introduction to linear statistical models. Design and analysis of simpler experimental configurations occurring frequently in engineering studies. Similarities and differences between regression and experiment design models emphasized in a vector-matrix setting.

215. *Statistical Decision Making.* 3 hr. PR or Conc.: I.E. 113. Basic concepts of probability theory. Discrete and continuous distributions, joint and derived distributions, with application to industrial and research problems. Introduction to generating functions and Markov chains. *(Course will not be offered in 1983-84.)*

216. *Industrial Quality Control.* 3 hr. PR: I.E. 113. Principles and methods for controlling the quality of manufactured products, with emphasis on both economic and statistical aspects of product acceptance and process control.

222. *Job Evaluation and Wage Incentives.* 3 hr. PR: I.E. 140 or consent. Principles used in evaluating jobs, rates of pay, characteristics and objectives of wage incentive plans, incentive formulae and curves.

240. *Labor and Productivity.* 3 hr. PR: Consent. The work force as a critical element of productivity. Topics include industrial engineering involvement in collective bargaining, labor relations, and work practices.

242. *Production Planning and Control.* 3 hr. PR: I.E. 140; Conc.: I.E. 214. Principles and problems in forecasting, aggregate planning, material management, scheduling, routing, and line balancing.

243. *Facility Planning and Design.* 3 hr. PR: I.E. 242, 250. Problems of facility and equipment location. Long-range planning of industrial facilities. Block and detailed layout of manufacturing plants and general offices. Space utilization and allied topics in facility design.

249. *Design of Dynamic Materials Systems.* 3 hr. PR: I.E. 140 or consent. Application of industrial engineering theory and practice to selection of material systems and equipment including efficient handling of materials from first movement of raw materials to final movement of finished product. Present quantitative design techniques.

250. *Introduction to Operations Research.* 3 hr. PR: I.E. 113, 281. Basic tools and philosophies of operations research. Tools include: linear programming, Markov chains, queuing theory, and simulation. Other operations research techniques are presented as they relate to the overall systems philosophy.

251. *Analytical Techniques of Operations Research.* 3 hr. PR: I.E. 113 or consent. Nonlinear optimization techniques useful in operations research and industrial engineering studies. Classical optimization techniques, quadratic, geometric and dynamic programming, branch and bound and gradient techniques. *(Course will not be offered in 1983-84.)*

259. *Introduction to Systems Engineering.* 3 hr. PR: I.E. 250, or consent. Quantitative synthesis of OR models. Definition of terms. Development and testing of assumptions, objectives, and restrictions. Measurement of parameters in the model. Optimization techniques and error sensitivity of the optimal solution. Implementing, utilizing, and updating the model. *(Course will not be offered in 1983-84.)*

260. *Human Factors Engineering.* 3 hr. PR: I.E. 113 or equiv. Includes the study of ambient environment, human capabilities and equipment design. Systems design for the human-machine environment interfaces will be studied with emphasis on health, safety, and productivity.

261. *System Safety Engineering.* 3 hr. PR: Consent. The concepts of hazard recognition, evaluation analysis and the application of engineering design principles to the control of industrial hazards.

277. *Engineering Economy.* 3 hr. PR: Math. 15, junior standing. Compound interest formulas for comparing alternatives before and after taxes. Depreciation principles, sensitivity analysis, replacement and risk analysis. Pay-back period, benefit-cost, and life cycle costing.

280. *Industrial Engineering Problems.* 1-3 hr. PR: Consent. Special problems.

281. *Digital Computation for Engineers.* 3 hr. Conc.: Math. 16. Introduction to FORTRAN programming for engineering students. Emphasis on development of skills in problem definition and coding. Class projects will be chosen to illustrate selected numerical and non-numerical processing methods.

282. *Digital Computer Concepts.* 3 hr. PR: I.E. 281 or consent. Principles of digital computer functional components. Study of digital operating systems including structure of the various subsystem components such as monitors, input control systems, and loaders.

283. *Information Retrieval.* 3 hr. PR: I.E. 281 or consent. Tools, elements, and theories of information storage and retrieval. Documentation, information framework; indexing; elements of usage, organization, and equipment; parameters and implementation; theories of file organization and system design. *(Course will not be offered in 1983-84.)*

284. *Simulation by Digital Methods.* 3 hr. PR: I.E. 113, 281, or consent. Introduction to Monte Carlo simulation methods and their application to decision problems. Student identifies constraints on problems, collects data for modeling and develops computer programs to simulate and analyze practical situations. Interpretation of results emphasized.

291. *Design of Productive Systems 1.* 3 hr. PR: Senior standing in industrial engineering. The integration of industrial engineering principles in the design of productive systems. Emphasis will be on analysis of different systems for productivity management.

292. *Design of Productive Systems 2.* 3 hr. PR: Senior standing in industrial engineering. Continuation of I.E. 291.

300. *Special Topics in Manufacturing Processes and Automation.* 3 hr. PR: I.E. 100 or equiv. Special topics concerning manufacturing processes and automation with special emphasis on manufacturing management.

314. *Design of Industrial Experiments.* 3 hr. PR: I.E. 214 or consent. Continuation of I.E. 214. Study of more complex experimental design especially useful to engineering and industrial researchers, including factorials and optimum-seeking design. Emphasis on use of existing digital computer routines and interpretation of results.

325. *Engineering Management.* 3 hr. A study of the unique problems of engineering organizations including project planning, managing creativity, coordinating design and development and other topics relevant to engineering organizations.

338. *Technology Forecasting.* 3 hr. A study of various procedures used in forecasting technological developments.

339. *Technology Assessment.* 3 hr. A study of various procedures used in technology assessment. The implications of technology in various aspects of society stressed. *(Course will not be offered in 1983-84.)*

340. *Work Analysis.* 3 hr. PR: Consent. Analysis of industrial engineering's involvement in analyzing work situations. Particular emphasis will be given to the use of industrial engineering as a change agent in improving work practices.

341. *Methods Analysis and Work Simplification.* 3 hr. Advanced study of techniques of methods analysis, including modern means of methods research. Development of appropriate cost analysis to accompany improved operating plans. Design, installation, and administration of work simplification programs, suggestion systems, and remuneration policies, and the means of intraplant communications concerning such programs. 2 hr. rec., 3 hr. lab. *(Course will not be offered in 1983-84.)*

342. *Advanced Production Control.* 3 hr. PR: I.E. 250. Different mathematical models useful in the design of effective production control systems. Various models covered include: static production control models under risk and under uncertainty, dynamic models under certainty, under uncertainty, and under risk.

353. *Applied Linear Programming.* 3 hr. PR: I.E. 250 or consent. Application of the assignment, transportation, and simplex algorithms to typical industrial problems. The methods and computational efficiencies of the revised simplex and other algorithms are also studied.

354. *Case Studies in Operations Research.* 3 hr. PR: Consent. This course will examine the applications of operations research procedures in a variety of applications. The course objective is to examine the factors which lead to successful model building through case studies. *(Course will not be offered in 1983-84.)*

355. *Scheduling and Sequencing Methods.* 3 hr. PR: I.E. 250. Theory and applications of analytical models used in the scheduling of operations. Topics include single machine scheduling models, flow shop models, job shop models, and assembly line balancing methods.

358. *Special Topics in Systems Analysis and Operations Research.* 3-6 hr. PR: Consent. Special topics from recent developments in operations research and related fields. Special emphasis on interests of current graduate students.

359. *Operations Research for Public Administrators.* 3 hr. Examination of role of quantitative analysis in pubic administration and decision making.

360. *Human Factors System Design.* 3 hr. PR: I.E. 260 or consent. Theoretical aspects and practical applications of man/machine relationships as they influence future system design. Student examines human limitations with respect to acceptance of information, decision making, and ability to transmit the result decisions to controlled equipment systems to obtain design optimization. 2 hr. rec., 3 hr. lab.

361. *Industrial Hygiene Engineering.* 3 hr. Introductory course in industrial hygiene, legal standards, historical context, and development. Topics include: respiratory physiology, particle size and deposition, ionizing and non-ionizing radiation, physical stress, solvents, metals, pesticides, painting, welding, and degreasing.

362. *Systems Safety Engineering.* 3 hr. PR: I.E. 261 or consent. Analysis of manufacturing methods, processes and properties of materials from a system safety engineering viewpoint. Emphasis will be placed on hazard analysis techniques (falttree, MORT, failure modes, and effects), and machine guarding methods.

364. *Industrial Ergonomics.* 3 hr. PR: I.E. 260 and consent. Practical experience in the application of ergonomic principles to industrial problems. Safety and production implications of work physiology, industrial biomechanics, and circardian rhythms, as well as current interest topics.

377. *Advanced Engineering Economy.* 3 hr. PR: Consent. Special emphasis on depreciation, engineering and economy aspects of selection and replacement of equipment; relationship of technical economy to income taxation, effect of borrowed capital and pricing model. 3 hr. rec.

381. *Integrated Data Processing.* 3 hr. PR: I.E. 281 and consent. Advanced work in electronic data-processing systems and procedures design. Case studies of integrated data-processing systems. Course projects include individual use of a computer in management data-processing analysis problems. 3 hr. rec.

385. *Digital Computer Applications.* 1 hr. PR: Senior standing in engineering, physical science or mathematics. Special study of selected programming languages. *(Course will not be offered in 1983-84.)*

389. *Special Topics in Industrial Data Processing Systems.* 3 hr. PR: I.E. 281 or consent. Selected topics relating to industrial applications of computer and data processing systems. Emphasis on applications not in the FORTRAN language. *(Course will not be offered in 1983-84.)*

Mechanical and Aerospace Engineering (M.A.E.)

NOTE: Courses in M.A.E. are open only to Engineering majors except those marked with an asterisk (*).

10. *Introduction to Aerospace Engineering 1.* I. 2 hr. PR: Math. 15. Introduction to the use of digital computer methods for engineering calculations. Preparation and execution of aerospace engineering oriented computer programs. 2 hr. lec., 2 hr. lab.

11. *Introduction to Aerospace Engineering 2.* II. 2 hr. PR: M.A.E. 10. Continuation of M.A.E. 10. 2 hr. lec., 2 hr. lab.

30. *Introduction to Mechanical Engineering.* 2 hr. PR: Engr. 2. Introduction to principles and techniques in mechanical engineering. 4 hr. lab.

41. *Statics.* 3 hr. PR or Conc.: Math. 16. Engineering applications of equilibrium of forces. Vector operations, couple and moment of force, resultants (2 and 3 dimensions), center of gravity and center of pressure, static friction, free body diagrams, equilibrium, trusses and frames. 3 hr. lec. or equivalent programmed instruction.

42. *Dynamics.* 3 hr. PR: M.A.E. 41; PR or Conc.: Math. 17. Newtonian dynamics of particles and rigid bodies. Engineering applications of equations of motion, work and energy, conservative forces, impulse and momentum, impulsive forces, acceleration in several coordinate systems, relative motion, instantaneous centers, and plane motion. 3 hr. lec. or equivalent programmed instruction.

43. *Mechanics of Materials.* 3 hr. PR: M.A.E. 41; PR or Conc.: Math. 17. Analysis of stress, deformation, and failure of solid bodies under the action of forces. Internal force resultants, stress, strain, Mohr's circle, mechanical properties of engineering materials, generalized Hooke's Law. Analysis axial, bending and buckling loads and combinations. 3 hr. lec. or equivalent programmed instruction.

100. *Inspection Trip.* (Credit.) PR: Senior standing.

101. *Thermodynamics.* 3 hr. PR: Phys. 11, Math. 17. Principles of thermodynamics; properties of gases and vapors; vapor cycles; internal combustion engines cycles; and refrigeration. Not open to students majoring in mechanical engineering. 3 hr. lec.

110. *Dynamics of Machines 1.* 3 hr. PR: M.A.E. 42; PR or Conc.: Math. 18. Kinematic analysis and synthesis of linkage, gears, cams, and other basic mechanisms. 3 hr. lec.

111. *Fluid Dynamics 1.* 3 hr. Coreq.: Math. 18. Properties of the fluid medium, dimensional analysis, hydrostatics, kinematics and dynamics of a fluid field, perfect fluid flow about a body, complex potential function, thin airfoil theory, conformal transformation. 3 hr. lec.

112. *Fluid Dynamics 2.* 4 hr. PR: M.A.E. 111, 140. Finite wing theory. Compressible, nonviscous fluids, isentropic flow, Prandtl-Meyer expansion, shock waves, airfoils in compressible flow, small perturbation theory, viscous effects. 4 hr. lec.

114. *Fluid Mechanics.* 3 hr. PR: M.A.E. 41. Fluid statics, laminar and turbulent flow of compressible and incompressible fluids, flow measurements, open channel flow, and kinetics of fluids. 3 hr. lec.

115. *Experimental Fluid Dynamics 1.* 3 hr. PR: M.A.E. 112. Subsonic and supersonic wind tunnel testing methods and practice. Experiments include the following measurements: Pressure distribution of bodies, boundary layer determination, turbulence measurements, force tests, and stability and performance determinations. Corrections for scale and jet boundary effects. Test design, data analysis, and engineering report preparation. 3 hr. lec., 2 hr. lab.

120. *Flight Vehicle Design.* 3 hr. PR: M.A.E. 142. Preliminary design of flight vehicles with regard for performance and stability requirements, considering aerodynamics, weight and balance, structure arrangement, configuration, guidance, and propulsion effects. Layout drawings and calculations are combined in a preliminary design report. 1 hr. lec., 6 hr. lab.

130. *Dynamics of Machines 2.* 3 hr. PR: M.A.E. 110. Static and dynamic force analysis in mechanical systems. Principles of vibration theory and balancing of rotating machinery. Rigid body motion and gyroscopes. 3 hr. lec.

134. *Mechanical Engineering Design.* 3 hr. PR: M.A.E. 43, 130. Fundamentals of mechanical design. Analysis of stress, deformation and failure modes. Rational design and selection of mechanical elements. Theory of lubrication and wear. Problem formulation and optimization of solutions. 3 hr. lec.

136. *Engineering Systems Design.* 3 hr. PR: M.A.E. 134, 182. Identification and solution of challenging engineering problems through rational analysis and creative synthesis. Planning, designing, and reporting on complex systems on individual and group basis. 6 hr. lab.

140. *Engineering Thermodynamics.* 3 hr. PR: Phys. 11, Math. 17. First and second laws of thermodynamics; energy equations; properties of gases and vapors; availability and thermodynamic relations. 3 hr. lec.

141. *Engineering Thermodynamics.* 3 hr. PR: M.A.E. 140. Continuation of M.A.E. 140. Gas and vapor cycles, mixtures of gases and vapors, chemical reactions, introduction to fluid mechanics. 3 hr. lec.

142. *Flight Mechanics.* 3 hr. PR: M.A.E. 111. Fundamental concepts of aircraft static and dynamic stability and control. Derivation of general equations of unsteady aircraft motion. Use of aerodynamic transfer functions and automatic control systems introduced. 3 hr. lec.

144. *Thermodynamics of Fluids.* 3 hr. PR: M.A.E. 140. The dynamics and thermodynamics of fluids. Integral formulation of basic laws for closed and open systems and control volumes. Effects of heat conduction, viscosity, and compressibility on free and boundary flows. 3 hr. lec.

150. *Flight Vehicle Propulsion.* 3 hr. PR: M.A.E. 112 or consent. Equilibrium combustion thermodynamics. Quasi one-dimensional flow with friction and total temperature change. Thermodynamics of aircraft engines. Aerodynamics of inlets, combustors, nozzles, compressors, and turbines. Performance of rockets. Ideal rocket analysis. 3 hr. lec.

160. *Flight Vehicle Structures 1.* 3 hr. PR: M.A.E. 43. Strength of thin walled structures in bending, shear, and torsion. Strain energy and application of Castigliano's theorem to bending of rings and curved bars, and to anaylsis of frames. Principle of virtual work and its application to beam and truss deflections and to statically indeterminate structures. 3 hr. lec.

161. *Flight Vehicle Structures 2.* 3 hr. PR: M.A.E. 160. Tension fields and the design of Wagner beam. Buckling of compression structures; bars, sandwich columns, wrinkling in sandwich construction, plates, shells and stiffened panels. Design for minimum weight. Introduction to matrix methods of structural analysis. Failure by fatigue and fracture. 3 hr. lec.

165. *Experimental Flight Vehicle Structures*. 2 hr. PR: M.A.E. 160. Tension properties and stress-strain curves of materials. Strain gage circuitry. Elastic and inelastic column buckling testing and theoretical comparison. Structural dynamics testing of vibrating beams. Shear tests by torsion, and torsion of thin-walled members. Observation of photoelastic and Moire fringe pattern techniques, and an introduction to fatigue testing. 1 hr. lec., 3 hr. lab.

170.* *Aviation Ground School*. 3 hr. Nomenclature of aircraft, aerodynamics, civil air regulations, navigation, meteorology, aircraft, and aircraft engines. May serve as preparation for private pilot written examinations. 2 hr. lec., 2 hr. lab.

171. *Mechanical Engineering Analysis*. 3 hr. PR or Conc.: Math. 18. Numerical and graphical techniques applied to the solution of mechanical engineering problems. Analog and digital computer programming. Data analysis. 2 hr. lec., 3 hr. lab.

180. *Mechanical Engineering Measurements*. 3 hr. PR: M.A.E. 140. Static and dynamic measurements of pressure, temperature, force, stress, displacement, etc. Calibration of instruments and error analysis. 2 hr. lec., 3 hr. lab.

182. *Engineering Systems Laboratory*. 2 hr. PR: M.A.E. 180; PR or Conc.: M.A.E. 134, 144, 171, 250. Experimental evaluation of modern and complex engineering systems. Participation in groups with oral and written presentation of results. 6 hr. lab.

200. *Advanced Mechanics of Materials 1*. 3 hr. PR: M.A.E. 43 or consent. Theories of failure and design procedures; time and temperature dependent behavior; shear center, unsymmetrical bending, curved beams. 3 hr. rec.

204. *Dynamics of Physical Systems*. 3 hr. PR: M.A.E. 42 and Math. 18 or consent. Physical systems such as hydraulic, mechanical, electrical, electromechanical, electrohydraulic, hydromechanical, and thermodynamic considered. Emphasis on the modeling of compound systems and studying their natural behavior using analytical techniques. Use of computers in analysis of physical systems. 3 hr. lab.

210. *Kinematics*. 3 hr. PR: M.A.E. 130 and Math. 18 or consent. Geometry of constrained motion, kinematics synthesis and design, special linkage. Coupler curves, inflection circle, Euler-Savary equation, cubic of stationary curvature and finite displacement techniques. 3 hr. lec.

215. *Experimental Fluid Dynamics 2*. 3 hr. PR: M.A.E. 115. Continuation of M.A.E. 115 with increased emphasis on dynamic measurements. Shock tube/tunnel and subsonic and supersonic measurements. Experiments include optical techniques, heat transfer to models, and viscous flow measurements. Error analysis of test data. 2 hr. lec., 3 hr. lab.

216. *Applied Aerodynamics*. 3 hr. PR: M.A.E. 142. Chordwise and spanwise airload distribution for plain wings, wings with aerodynamic and geometric twist, wings with deflected flaps, and wings with ailerons deflected. Section induced drag characteristics. 3 hr. lec.

220. *Guided Missile Systems*. 3 hr. PR: M.A.E. 112 and/or Conc.: M.A.E. 150. Design philosophy according to mission requirements. Preliminary configuration and design concepts. Aerodynamic effects on missiles during launch and flight. Ballistic missile trajectories. Stability determination by analog simulation. Performance determination by digital and analog simulation. Control, guidance, and propulsion systems. Operational reliability considerations. 3 hr. lec.

222. *Mechanical Vibrations*. 3 hr. PR: Math. 18, M.A.E. 130, or consent. Fundamentals of vibration theory. Free and forced vibration of single and multiple degree of freedom systems. Solution by Fourier and Laplace transformation techniques. Transient analysis emphasized. Energy methods. 3 hr. lec.

232. *V/STOL Aerodynamics*. 3 hr. PR: M.A.E. 112. Fundamental aerodynamics of V/STOL aircraft. Topics include propeller and rotor theory, helicopter performance, jet flaps, ducted fans, and propeller-wing combinations. 3 hr. lec.

234. *Fluid Dynamics 3*. 3 hr. PR: M.A.E. 112. Fundamentals of viscous flow and the Navier-Stokes equation; incompressible laminar flow in tubes and boundary layers; transition from laminar to turbulent flow; incompressible turbulent flow in tubes and boundary layers. 3 hr. lec.

235. *Fluid Dynamics 4*. 3 hr. PR: M.A.E. 112. One-dimensional non-steady gas-dynamics. Shock tube theory and applications. Fundamentals of supersonic and hypersonic flow and determination of minimum drag bodies. 3 hr. lec.

236. *Systems Analysis of Space Satellites*. 3 hr. PR: Senior standing. Introduction to engineering principles associated with analysis and design of space satellites. Emphasis on the inderdisciplinary nature of satellite systems analysis. 3 hr. lec.

238. *Introduction to Underwater Engineering*. 3 hr. PR: Consent. Underwater portion of our world with emphasis on science and technology. Emphasis on economic and social needs for maritime resources, martime law, and public policy, as well as general and basic engineering aspects of underwater communication, navigation, and structures. 3 hr. lab.

240. *Problems in Thermodynamics*. 3 hr. PR: M.A.E. 141 or consent. Thermodynamic systems with special emphasis on actual processes. Problems presented are designed to strengthen the background of the student in the application of the fundamental thermodynamic concepts. 3 hr. lec.

242. *Flight Testing*. 3 hr. PR: M.A.E. 142. Applied flight test techniques and instrumentation, calibration methods, determination of static performance characteristics, and introducion to stability and control testing based on flight test of Cessna Super Skywagon airplane. Flight test data analysis and report preparation. 1 hr. lec., 6 hr. lab.

243. *Bioengineering*. 3 hr. PR: M.A.E. 43; Phys. 201 or consent. Introduction to human anatomy and physiology using an engineering systems approach. Gives the engineering student a basic understanding of the human system so that the student may include it as an integral part of the design. 3 hr. lec.

244. *Introduction to Gas Dynamics*. 3 hr. PR: M.A.E. 144 or consent. Fundamentals of gas dynamics, one-dimensional gas dynamics and wave motion, measurement, effect of viscosity and conductivity, and concepts of gas kinetics. 3 hr. lec.

249.* *Space Mechanics*. 3 hr. PR: Math. 18, M.A.E. 42. Flight in and beyond the earth's atmosphere by space vehicles. Laws of Kepler and Orbital theory. Energy requirements for satellite and interplanetary travel. Exit from and entry into an atmosphere. 3 hr. lec.

250. *Heat Transfer*. 3 hr. PR: M.A.E. 101 or 140. Steady state and transient conduction. Thermal radiation. Boundary layer equations and forced and free convection are also covered. 3 hr. lec.

252. *Advanced Topics in Propulsion*. 3 hr. PR: M.A.E. 150 or consent. Special problems of thermodynamics and dynamics of aircraft power plants. Chemical rocket propellants and combustion. Rocket thrust chambers and nozzle heat transfer. Nuclear rockets. Electrical rocket propulsion. 3 hr. lec.

254. *Applications in Heat Transfer*. 3 hr. PR: M.A.E. 250. For students desiring to apply basic heat transfer theory and digital computation techniques to problems involving heat exchangers, power plants, electronic cooling, manufacturing processes, and environmental problems. 3 hr. lec.

260. *Design of Flight Structures 1*. 3 hr. PR: M.A.E. 161. Structural design and analysis of flight vehicle members. Layout and detail design of specified components are required. 1 hr. lec., 6 hr. lab.

262. *Internal Combustion Engines.* 3 hr. PR: M.A.E. 101 or 141. Thermodynamics of internal combustion engine; Otto cycle; Diesel cycle, gas turbine cycle, two- and four-cycle engines, fuels, carburetion, and fuel injection; combustion; engine performance, supercharging. 3 hr. lec.

264. *Heating, Ventilating, and Air Conditioning.* 3 hr. PR: M.A.E. 141 or consent. Methods and systems of heating, ventilating, and air conditioning of various types of buildings, types of controls and their application. 3 hr. lec.

265. *Aeroelasticity.* 3 hr. PR: M.A.E. 160. Vibrating systems of single degree and multiple degrees of freedom, flutter theory and modes of vibration, torsional divergence and control reversal. 3 hr. lec.

280. *Aerospace Problems.* 1-6 hr. PR: Upper-division and graduate standing.

282. *Engineering Acoustics.* 3 hr. PR: Math. 18 or consent. Theory of sound propagation and transmission. Important industrial noise sources and sound measurement equipment. Selection of appropriate noise criteria and control methods. Noise abatement technology. Laboratory studies and case histories. 3 hr. lec.

284. *Introduction to Feedback Control.* 3 hr. PR: Math. 18, E.E. 105 or M.A.E. 204 or consent. Fundamentals of automatic control theory. Transfer functions and block diagrams for linear physical systems. Proportional, integral, and derivative controllers. Transient and frequency response analysis using Laplace transformation. 3 hr. lec.

285. *Thesis.* 2-6 hr. PR: Senior standing and consent.

290. *Seminar.* 1-6 hr. PR: Junior, senior, or graduate standing, and consent.

291. *Introduction to Research.* 1-3 hr. PR: Senior standing and consent. Methods of organizing theoretical and experimental research. Formulation of problems, project planning, and research proposal preparation.

292. *Research Problems.* 2-6 hr. PR: M.A.E. 291 or consent. Performance of the research project as proposed in M.A.E. 291. Project results are given in written technical reports, with conclusion and recommendations.

294. *Special Topics.* 1-6 hr. PR: Junior, senior, or graduate standing, and consent.

299. *Special Problems.* 1-6 hr. PR: Junior, senior, or graduate standing.

300. *Seminar.* (Credit.) Attendance required of all aerospace graduate students at scheduled aerospace engineering seminars.

301. *Advanced Engineering Acoustics.* 3 hr. PR: M.A.E. 282 or consent. Study of complex sound generation and the propagation, transmission, reflection, and absorption of air-borne and structure-borne sound. Coupling of sound and vibration in structures. Acoustical behavior and characteristics of materials.

305. *Analytical Methods in Engineering 1.* 3 hr. PR: Consent. Index notification for determinants, matrices, and quadratic forms; linear vector spaces, linear operators including differential operators; calculus of variations, eigenvalue problems, and boundary value problems.

306. *Analytical Methods in Engineering 2.* 3 hr. PR: M.A.E. 305 or at least two semesters of advanced calculus. Intended for advanced graduate students interested in modern analysis for engineering applications.

307. *Nonlinear Analysis in Engineering.* 3 hr. PR: Consent. Special topics in nonlinear analysis of various types of engineering systems. Various numerical, approximate, and analytical techniques chosen to suit the needs and interests of advanced graduate students.

310. *Advanced Mechanics of Materials 2.* 3 hr. PR: Consent. Beams on elastic support, cylindrical shells with bending, torsion of noncircular members, two-dimensional applications in elasticity, contact stresses, and simple problems in plates and shells. 3 hr. lec.

312. *Inelastic Behavior of Engineering Materials.* 3 hr. PR: M.A.E. 41, 42, 43, and consent. Characterization and modeling of typical engineering materials, elastic, viscoelastic, and plastic materials, design considerations.

315. *Fluid Flow Measurements.* 3 hr. PR: M.A.E. 112 or consent. Principles and measurements of static and dynamic pressures and temperatures, velocity and Mach number and forces. Optical techniques and photography. Design of experiments. Review of selected papers from the literature. 2 hr. lec., 3 hr. lab.

316. *Energy Methods in Applied Mechanics.* 3 hr. PR: Consent. Variational principles of mechanics and applications to engineering problems; principles of virtual displacements, minimum potential energy, and complementary energy. Castigliano's theorem, Hamilton's principle. Applications to theory of plates, shells, and stability. 3 hr. lec.

318. *Continuum Mechanics.* 3 hr. PR: M.A.E. 41, 42, 43. Basic laws of physical behavior of continuous media. Analysis of stress; equations of motion and boundary conditions; kinematic analysis; rates of strain, dilation and rotation; bulk time, rates of change; constitutive equations with special attention to elastic bodies and ideal fluids; energy equations and the first law of thermodynamics. 3 hr. lec.

320. *Theory of Elasticity 1.* 3 hr. Cartesian tensors; equations of classical elasticity, energy, minimum, and uniqueness theorems for the first and second boundary value problems; St. Venant principle; extension, torsion, and bending problems. 3 hr. lec.

322. *Advanced Vibrations 1.* 3 hr. PR: M.A.E. 222 or consent. Dynamic analysis of multiple degree of freedom discrete vibrating systems. Lagrangian formulation matrix and numerical methods, impact and mechanical transients.

325. *Experimental Stress Analysis.* 3 hr. PR: M.A.E. 41, 42, 43. Classical photoelasticity, brittle lacquers, birefrigent coatings, strain gage techniques and instrumentation, as applied to problems involving static stress distributions. 2 hr. lec., 3 hr. lab.

330. *Instrumentation in Engineering 1.* 3 hr. PR: Consent. Theory of measuring systems, emphasizing measurement of rapidly changing force, pressure, strain, temperature, vibration, etc. Available instruments, methods of noise elimination, types of recording studied. Special value to student in experimental research. 2 hr. lec., 3 hr. lab.

333. *Advanced Machine Design.* 3 hr. PR: M.A.E. 134 or consent. Design for extreme environments, material selection, lubrication and wear, dynamic loads on cams, gears, and bearings, balancing of multi-engines and rotors, electromechanical components.

340. *Advanced Thermodynamics 1.* 3 hr. PR: M.A.E. 141 or consent. First and second laws of thermodynamcs with emphasis on the concept of entropy production. Application to a variety of nonsteady open systems, thermodynamics of multiphase, multicomponent, and reacting systems. Criteria for equilibrium and stability.

342. *Advanced Thermodynamics 2.* 3 hr. PR: M.A.E. 340 or consent. Continuation of topics related to reactive systems. Adiabatic flame temperatures, reaction kinetics, conservation of species equations, flame propagation and detonation.

344. *Statistical Thermodynamics.* 3 hr. PR: M.A.E. 340 or equiv. Microscopic thermodynamics for Boltzmann, Bose-Einstein, and Fermi-Dirac statistics. Schrodinger wave equation, partition functions for gases and solids.

348. *Heat Transfer*. 3 hr. PR: Undergraduate course in heat transfer or consent. *(Graduate course in heat transfer primarily for mechanical and aerospace engineering students.)* Topics include one-, two-, and three-dimensional thermal conduction involved in mechanical processes both for constant and time varying temperature fields, free and forced convection in heat exchangers, heat power equipment and aircraft and radiative heat transfer between surfaces and absorbing media as found in furnaces, industrial processes, and aerospace applications.

350. *Conduction Heat Transfer*. 3 hr. PR: M.A.E. 250 or consent. Analytical, numerical, graphical, and analog solutions of steady and non-steady heat conduction problems in isotropic and anistropic solids. Thermal properties, extended surfaces, thermal stress, interphase conduction with moving interface, localized and distributed sources.

352. *Intermediate Dynamics*. 3 hr. PR: M.A.E. 42. Newtonian and Lagrangian mechanics. Dynamics of discrete systems and rigid bodies analyzed utilizing Newtonian and Lagrangian formulations.

353. *Advanced Dynamics 1*. 3 hr. PR: M.A.E. 352 or consent. Analytical mechanics. Stability of autonomous and non-autonomous systems considered and analytical solutions by perturbation techniques introduced. Hamilton-Jacobi equations developed. Problems involving spacecraft, gyroscopes, and celestial mechanics studied.

354. *Convection Heat Transfer*. 3 hr. PR: M.A.E. 250 or consent. Laminar and turbulent flows. Analytical, numerical, and analogical solution. Selected topics study of current research publications.

355. *Radiation Heat Transfer*. 3 hr. PR: M.A.E. 250 or consent. Classical derivation of black body radiation laws; gray body and non-gray analysis; radiant properties of materials, radiant transport analysis; specular-diffuse networks, gas radiation, thermal radiation measurements; analytical, numerical solutions, and study of selected current publications.

360. *Fluid Mechanics 1*. 3 hr. PR: M.A.E. 144 or equiv. Advanced dynamics and thermodynamics of fluids. Basic laws of conservation of mass and momentum in differential, vector, and integral forms. Application to internal flows, fluid machinery, and structures.

364. *Turbomachinery*. 3 hr. PR: M.A.E. 101 or 141. Flow problems encountered in design of water, gas, and steam turbines, certrifugal and axial flow pumps and compressors, design parameters.

380. *Special Problems*. 2-4 hr. PR: Consent of department chairperson. For graduate students in the non-research program. The student will select a specialized field and follow a course of study in that field under the supervision of a counselor.

381. *Specialized Study Program*. 1-6 hr. PR: Consent. Discussion, individual study reports in aerospace engineering.

384. *Feedback Control in Mechanical Engineering*. 3 hr. PR: M.A.E. 284 or consent. Control analysis of hydraulic and pneumatic closed-loop systems including spool valves, flapper valves, pumps, servomotors, and electrohydraulic servomechanisms. Investigation on nonlinearities by phase plane, Liapunov, and describing function techniques. Programming for analog and digital computer simulation. Introduction to fluidic elements and logic circuits.

394. *Special Topics*. 1-6 hr. For senior and graduate students.

399. *Special Problems*. 1-6 hr. For senior and graduate students.

University Honors Program

Admission to the University Honors Program may be granted: (1) to incoming freshman students on the basis of ACT scores and high school grades; and (2) to students enrolled in WVU who have a cumulative grade-point average of 3.7, or better, and who have earned no fewer than 12 nor more than 40 hours of credit at WVU.

The requirements for designation as a University Honors Scholar are as follows:

1. Completion of a minimum of 27 hours of designated Honors courses. Of these, 3 hours will be earned in a senior-year seminar and at least 3 and no more than 6 hours in a summer guided-project program. These 27 hours will not be in addition to the honors normally required for graduation. They will be part of that total requirement.

2. While it is expected that an Honors student will be enrolled in an Honors course each semester, demands of professional programs, etc., may make adjustments necessary. With the adviser's approval, a student may petition the Honors Coordinator and Honors Council for exception.

3. Normally only courses designated as Honors courses by the Honors Coordinator and the Honors Council will be counted in the 27-hour requirement. However, if a student takes courses judged by the Council to be rigorous and challenging enough to qualify as honors courses, the student may petition, in advance, the Coordinator and Council for permission to count the hours as Honors hours. In each case, the student must submit a petition to the Coordinator and the Council for such an exception. Each instance will be judged separately and on its own merits and the Coordinator and the Council must state in writing the decision reached. This statement will be placed in the student's record and will be part of the academic record.

4. Once a student is accepted into the University Honors Program, continuance will depend upon satisfactory progress in hours earned (enrollment for at least 12 hours a semester) and maintenance of a satisfactory cumulative grade-point average as outlined below:

a. 1-28 hours earned, inclusive 3.2
b. 29-88 hours earned, inclusive 3.3
c. 89, or more 3.4

If a student fails to maintain satisfactory progress toward the degree and/or to achieve the required minimum cumulative grade-point average, the student will be placed on probation in the University Honors Program for one semester. If at the end of that semester the student has not achieved the required grade-point average and/or the number of hours completed, the student will be dropped from the University Honors Program. This action will not by itself affect the student's standing as a student in the University or in the degree program. It does mean that the student will not be designated a University Honors Scholar upon graduation.

Students who complete the requirements will be designated in their transcripts and on their diplomas as University Honors Scholars.

Honors (Honor)

192. *Senior Honors Seminar.* I, II. 3 hr. PR: Senior standing and membership in University Honors Program and permission of University Honors Program Director. Careful investigation of and independent research on a topic approved in advance by the University Honors Director-University Honors Council, and instructor.

College of Human Resources and Education

If you enjoy working with people in helping them realize their potential, the College of Human Resources and Education will prepare you for a career in such fields as counseling, dietetics, home economics, speech pathology and audiology, special education, health education, teaching, and human services in business, industry, and governmental agencies.

At the undergraduate level the College of Human Resources and Education is organized into the departmental program and service areas of Curriculum and Instruction, Special Education, Speech Pathology and Audiology, Educational Psychology, Health Education, Reading, and Family Resources. Degrees in every teaching field—from early childhood education to secondary school specializations—are offered through the Department of Curriculum and Instruction. The most modern instructional facilities strengthen the specialized programs provided in Speech Pathology and Audiology. Students in Family Resources may study in such fields as textiles and clothing, nutrition and foods, interior design and housing, home economics, and child development.

All programs lead to the baccalaureate degree, preparation for graduate work, certification and licensure in teaching, or other specialization related careers. A strong liberal arts background is necessary for students to benefit fully from the college's programs. Students spend part of their first two academic years taking such liberal arts courses as literature, economics, history, mathematics, and courses in the natural and physical sciences. Students preparing for teaching careers are also exposed to classroom teaching.

Admission

Requirements for admission to the undergraduate programs of the College of Human Resources and Education are listed by program areas in subsequent pages of this *Catalog*.

Candidates for bachelor's degrees in Family Resources and in Speech Pathology and Audiology may enter those programs during their freshman years.

Students who enter Education must have completed a minimum of 58 semester hours with a grade-point average of at least 2.0 on all work attempted. These candidates register for their first two years of work in the College of Arts and Sciences as pre-Education majors. Freshmen and sophomores who expect to enter the teaching profession will indicate their intention when they register. Their studies will be directed by advisers for pre-Education students. Such students should arrange their courses of study so as to satisfy requirements for junior standing and should be fulfilling requirements for certification of teachers.

Complete information concerning WVU admissions, registration, fees and expenses, and regulations may be obtained in Part 2 of the *Undergraduate Catalog*.

Faculty

Diane L. Reinhard, Ph.D. (Ohio St. U.), *Dean of College of Human Resources and Education and Professor.*

John L. Carline, Ph.D. (Syracuse U.), *Associate Dean and Professor.*
Ernest R. Goeres, Ph.D. (U. Iowa), *Assistant Dean and Associate Professor.*
Laddie R. Bell, Ed.D. (U. Va.), *Assistant Dean for Off-Campus Education and Professor.*
Ranjit K. Majumder, Ph.D. (Fordham U.), *Assistant Dean and Professor.*

Department of Counseling and Guidance and Rehabilitation Counseling

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J. William Douglas, Ph.D. (Ohio St. U.), *Adjunct Associate Professor.*
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Marilyn M. Fairbanks, Ph.D. (WVU), *Professor.*
John P. Helfeldt, Ph.D. (Syracuse U.), *Associate Professor.*
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Department of Education Administration

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Department of Speech Pathology and Audiology

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Carolyn P. Atkins, Ed.D. (WVU), *Associate Professor.*
Lynn R. Cartwright, M.S. (WVU), *Assistant Professor.*
Leonard M. Davis, Ph.D. (Northwestern U.), *Professor.*
Robin R. Jones, M.S. (WVU), *Assistant Professor.*
Anthony G. Mlcoch, Ph.D. (Purdue U.), *Assistant Professor.*
Cheryl L. Prichard, M.S. (WVU), *Instructor.*
Deborah G. Perfetto, M.S. (WVU), *Lecturer (part-time).*
Dennis M. Ruscello, Ph.D. (U. Ariz.), *Associate Professor.*
Kenneth O. St.Louis, Ph.D. (U. Minn.), *Associate Professor.*
John E. Tecca, Ph.D. (Purdue U.), *Assistant Professor.*
Mary Ellen Tekieli, Ph.D. (U. Okla.), *Associate Professor.*
Pamela G. Weyrich, M.Ed. (Smith C.), *Instructor (part-time).*
Charles M. Woodford, Ph.D. (Syracuse U.), *Associate Professor.*

Department of Technology Education

Paul DeVore, Ed.D. (Penn St. U.), *Professor and Chairperson.*
Thomas J. Brennan, Ed.D. (Bradley U.), *Professor Emeritus.*
George Maughan, Ed.D. (WVU), *Assistant Professor.*
David L. McCrory, Ph.D. (Case West. Res. U.), *Professor.*
Edward C. Pytlik, Ph.D. (Iowa St. U.), *Associate Professor.*
Mark R. Skinner, Ed.D. (WVU), *Assistant Professor.*

University Affiliated Center

Ashok S. Dey, M.A. (NYU), *Research Assistant Professor and Program Director.*
Stephen Amato, Ph.D. (NYU), *Adjunct Professor.*
Guy H. Brooks, M.A. (WVU), *Research Instructor.*
Katharine S. Brooks, M.S. (WVU), *Research Instructor.*
John D. Cone, Ph.D. (U. Wash.), *Professor.*
Karen A. Connors, Ph.D. (Temple U.), *Assistant Professor.*
Karen Miles, M.S.N. (WVU), *Assistant Professor.*
Cindy Parrish, M.L.A. (WVU), *Clinical Instructor.*
Cheryl L. Prichard, M.S. (WVU), *Instructor.*
Laura Rothstein, J.D. (Georgetown U.), *Associate Professor.*
Ann Sauvageot, M.S. (WVU), *Research Instructor.*
Luise Savage, M.S. (Ind. U. Pa.), *Research Instructor.*
Mark D. Souther, Ed.D. (WVU), *Research Assistant Professor.*
Jana Trojan, B.S. (Colo. St. U.), *Research Instructor.*
Laura C. Walker, M.S.W. (WVU), *Adjunct Research Instructor.*
Diane T. Woodrum, Ed.D. (WVU), *Assistant Professor.*
Donald R. Wuori, M.D. (SUNY), *Adjunct Associate Professor.*

University Core Curriculum Courses

The following courses in the College of Human Resources and Education meet the University criteria to qualify for Core Curriculum credit:

Education Foundations 1—*Core B.*

Multidisciplinary Studies 60—*Core B or C;* MDS 91-92—*Core A, B, or C.*

Technology Education 280-281—*Core B.*

Curriculum and Instruction

The program area of Curriculum and Instruction prepares students for the teaching professions. Graduates are prepared to work in schools, businesses, industry, and governmental agencies. Many advances have been made in developing good learning conditions for children, youth., and adults. The teacher and other education professionals are designing and operating educational systems to provide these optimum learning opportunities. The prospective teacher is influenced as much by the way the classes are taught as by what is taught. The program at WVU emphasizes individual learning, flexible schedules, student decision making, small group interaction, and the teacher as a human being.

In the self-instruction laboratory, students work as individuals, or in small groups of their own choosing. When they feel they have mastered the particular concepts or techniques, they ask to be tested. If found proficient, they go on to other tasks; if not, they continue work in the laboratory, at their own pace and at their own convenience.

Simulation techniques are employed using specially developed films or other materials. The student assumes the role of the teacher observing classroom conditions which may prevail and makes decisions at certain critical points. The student then sees the consequences of a decision as portrayed by an actual classroom under similar conditions. The student, classmates, and professor then discuss the situation and the results.

Micro-teaching is utilized to enable the student to teach small groups of peers and children for short periods of time. The teaching is recorded by audio or videotape so that the student may view the teaching and analyze alone or with others. Students also have direct experiences with youngsters working as teacher-aides, tutors, and student teachers.

West Virginia University is accredited by the National Council for Accreditation of Teacher Education and the State Department of Education for the preparation of elementary teachers, secondary teachers, school service personnel, and school administrators, with the Doctor of Education as the highest degree approved.

West Virginia Board of Education Regulation for Teacher Certification

The West Virginia Board of Education requires that 100 of the 128 semester hours required for certification shall be completed in regularly scheduled campus courses. The 28 hours of permissible nonresidence courses may be earned by off-campus study, home study (correspondence), radio, television, special examination, and/or military service.

Graduation Requirements

To be eligible for recommendations for the degrees of Bachelor of Science in Secondary Education or Bachelor of Science in Elementary Education, a candidate must:

1. Comply with the general regulations of the University concerning entrance, advanced standing, classification, examination, marks, grade points, etc.
2. Satisfy the following requirements:
   a. Complete the required courses and the minimum number of hours of approved elective courses in education, if any.
   b. Select and pursue subject specialization(s) for the B.S. in Secondary Education or the B.S. in Elementary Education.
   c. Adhere to the patterns prescribed in completing the subject specialization(s).
   d. Present a minimum of 128 hours of approved college credit, if in Secondary Education, or in Elementary Education. A general average of C as described under "General Requirements for Certification" must be attained for the total hours (Math. 2 will not be counted toward meeting the total hours for graduation.) Forty-five of these hours must be upper-division courses.
   e. Complete 26 hours after enrolling in the program area of Curriculum and Instruction.
   f. Be at least 18 years of age, of good moral character, interested in education work, and mentally, physically, and otherwise qualified to perform the duties of a teacher.

Since requirements for teacher certification may be changed between catalog printings, programs as appearing in this edition will not guarantee eligibility for a professional certificate. Up-to-date information related to certification may be obtained from the Office of Student Advising and Records, 608 Allen Hall.

The College of Human Resources and Education may require appropriate standardized tests of its graduates.

Reciprocal Certification Agreements

West Virginia, at the time of publication, has reciprocal agreements on teacher certification with other states. Any inquiries relevant to reciprocity in certification can be made through the Office of Student Advising and Records, 608 Allen Hall.

General Requirements for Professional Certificates

West Virginia University standards for admission to the teacher education program should not be confused with the minimum state standards for certification. Admissions standards for elementary and secondary education are set forth on pages herein.

To teach in the public schools of West Virginia, one must hold a certificate issued by the West Virginia Department of Education. Before any WVU applicant is eligible to receive a professional certificate the applicant must have: (1) met the minimum state requirements; (2) met the University degree requirements; (3) been recommended by the Dean of the College of Human Resources and Education as herein prescribed; and (4) taken the National Teachers Examination: (a) Core battery tests are to be taken; (b) Secondary majors (7-12; K-12) are to take the subject area in which student teaching was completed; (c) Elementary Education Majors (1-6; N-6) are to take the Education in the Elementary School (section 01) test. Elementary Education Majors should NOT take the Mental Retardation, Early Childhood Education, or 4-8 Subject Area Examinations.

The College of Human Resources and Education will inform each of its students who is a prospective teacher, and any other prospective teacher, upon request, of the requirements for certification, and will assist in preparing a program of study to meet these requirements. It is the obligation of the student who desires such counsel to arrange a conference some time before the end of the sophomore year.

A candidate for certification is required to achieve a grade-point average of 2.0 (C) or better as follows: (1) on the total of college credits earned; (2) on the hours earned in education; (3) in student teaching; and (4) in each subject specialization.

The West Virginia Department of Education uses a system of calculating grade-point averages for certification purposes which differs in some respects from WVU's system. All course work attempted at WVU and at other institutions of collegiate grade will be considered. If a student earns a grade of D, F, or U in any course taken no later than the semester or summer when the student has attempted a total of 60 hours, and if the student repeats this course, the first grade shall be disregarded for the purpose of determining the student's grade-point average and the second grade earned shall be used.

The Department of Curriculum and Instruction employs the West Virginia Department of Education's system of calculating grade-point averages only for purposes of admission to Curriculum and Instruction, for admission to student teaching, and for assessing teaching field and education averages. Academic performance and eligibility for graduation will be assessed by the system employed by WVU and the Board of Regents institutions.

The Dean of the College of Human Resources and Education recommends candidates for professional certificates only after the completion of work for the baccalaureate degree. To be eligible for recommendation by the University for any professional certificate, the applicant must have done student teaching under the supervision of the College of Human Resources and Education. The applicant must apply for the certificate.

At least 45 hours of upper-division work, WVU standards, are required for all teaching certificates. The qualifications herein prescribed are minimum, not optimum or maximum, and must be met by all candidates.

PROGRAMS FOR ELEMENTARY AND EARLY CHILDHOOD SCHOOL TEACHERS

Requirements for Degree of Bachelor of Science in Elementary Education and for Recommendation for Professional Certificate, Grades 1-6, N-6, and 4-8

Lower-Division Work

In preparing for admission to the Department of Curriculum and Instruction and the work of preparing for teaching at early childhood and elementary levels, students will register in their freshman and sophomore years in the pre-Education program of the College of Arts and Sciences and pursue the program of general education that the State Board of Education has prescribed for all students who seek recommendation for teaching certificates. This program of prescribed work is included in the "Program for Elementary and Early Education Teachers."

Upper-Division Work

For admission to the prescribed courses in Elementary Education, students must register the final two years in the Department of Curriculum and Instruction. The following will be required:

1. Must have completed 58 hours of approved college work.
2. A grade-point average of 2.25 on all work attempted for enrollment in the student teaching block.

In lower-division work students should pursue the required lower-division courses, so that the greatest possible number of hours taken during the junior and senior years may be courses having upper-division credit.

To become eligible for recommendation for the degree of Bachelor of Science in Education and for the Professional Certificate, Grades 1-6, the student must complete the required curriculum and plan of work with a grade-point average of 2.0 (C) or better, as follows: (1) on the total of college credits earned; (2) on the hours earned in education; (3) in the subject specialization; and (4) in student teaching; and the student must have been enrolled in the Department of Curriculum and Instruction for at least 30 hours of work, including a minimum of 12 hours in student teaching.

PROGRAMS FOR UNDERGRADUATE ELEMENTARY AND EARLY CHILDHOOD EDUCATION, GRADES 1-6, N-6, and 4-8

GENERAL ACADEMIC CONCENTRATION

(128 semester hours required)

It is recommended that the Professional Certificate, Grades 1-6 be endorsed with one subject specialization for teaching in Grades 4 through 8, in Middle Schools. Those wishing certification for teaching at the kindergarten or pre-school level may elect the specialization option. Below are listed the categories of work for each.

	Required Sem. Hr.
GENERAL STUDIES REQUIREMENTS	67
HEALTH AND PHYSICAL EDUCATION	6
Hl. Ed. 101—Elementary School Health Program	2
G.P.E. 41—Movement Education and Rhythms	1
G.P.E. 42—Elementary Sports Skills	1
P.P.E. 43—Physical Education for Elementary Teachers	2
HUMANITIES	22
Art 3—Materials and Procedure*	3
Music 41—Music As an Art and Science*	2
Music 42—Music Materials and Procedures*	2
Engl. 1 and 2—Composition and Rhetoric*	6
Engl. 35 or 36—Poetry-Drama, or Short Story-Novel	3
L. Sci. 203—Literature for Children	3
Rdng. 221—Developmental Reading	3

*Meets core and general studies requirements.

SCIENCE AND MATHEMATICS	21
P. Sci. 1 and 2—Introductory General Course*	8
Biol. 1 or 2—General Biology	4
Math. 33, 34—Introductory Mathematics for Teachers (N-8)*	6
Math. 131—Informal Geometry and Algebra for Teachers (N-8)	3

*Meets core and general studies requirements.

	Required Sem. Hr.
SOCIAL STUDIES	18
S. Sci. 1—Introductory General Course	3
Hist. 1 or 2—Western Civilization	3
Hist. 52 or 53—American History	3
Soc. & A. 1—Introduction to Sociology, *or*	
Soc. & A. 5—Introduction to Anthropology, *or*	
Soc. & A. 102—Social Problems, *or*	
Ed. F. 1—Education in the American Culture, *or*	
Pol. S. 2—The American Federal System, *or*	
Geog. 1—Introduction to Geography, *or*	
Geog. 7—Physical Geography, *or*	
Geog. 8—Human Geography, *or*	
Geog. 109—Economic Geography, *or*	
Geog. 140—Geography of United States and Canada, *or*	
Psych. 1—Introduction to Psychology	9
SPECIALIZATION AVAILABLE*	15-30
Available, with additional certification, as indicated: Early Education, 4-8 specializations to include Foreign Languages, Home Economics, Language Arts, Mathematics, Science or Social Studies; and K-12, Special Education—MR, Library Science K-12.	
*Hours to be taken above requirements for elementary teachers.	
ELECTIVES	0-20
For students not selecting a specialization and to complete the minimum requirement of 128 hours for graduation.	
PROFESSIONAL EDUCATION	41
C&I 7—Introduction to Education	2
Ed. P. 103 and 105—Human Development and Learning	6
C&I 120—Elementary-Early Childhood Language Arts	3
Pre-Student Teaching Block	
C&I 100—Elementary-Early Childhood General Methods	3
C&I 130—Elementary-Early Childhood Mathematics	3
C&I 140—Elementary-Early Childhood Science	3
C&I 150—Elementary-Early Childhood Social Studies	3
Rdng. 240—Corrective Language Arts Techniques	3
Student Teaching	12
C&I 187—Student Teaching: Elementary-Early Childhood, *or*	
C&I 187 and Sp. Ed. 280—Elementary Student Teaching and Special Education Students Teaching (6 hours each)	
C&I 280—Special Problems and Workshops: Student Teaching Seminar	3

SPECIALIZATION FOR EARLY CHILDHOOD
EARLY CHILDHOOD EDUCATION N-6

Required Courses	19-20
CDFS 112—Toddler and Preschool Development	3
CDFS 216—Child Development Practicum	3-4
C&I 210 and 211—Early Childhood Education	6
C&I 214—Creative Experiences in Early Childhood	3
G.P.E. 40—Early Childhood Activities	1
SPA 250—Speech-Language-Hearing: Development and Disorders	3

Required
Sem. Hr.

SPECIALIZATION FOR GRADES 4 THROUGH 8

FOREIGN LANGUAGES—GRADES 4-8

French—Grades 4-8

Required Courses

Frch. 1, 2—Elementary French 6
Frch. 3, 4—Intermediate French 6
Frch. 103, 104—Advanced French 6
Frch 217—French Civilization, *or*
Frch. 292—Pro-Seminar: French Culture 3
Frch. 231—Pronunciation and Phonetics 3
Lang. 221 (C&I 125)—The Teaching of Foreign Languages 3

Spanish—Grades 4-8

Required Courses

Span. 1, 2—Elementary Spanish 6
Span. 3, 4—Intermediate Spanish 6
Span. 103, 104—Advanced Spanish 6
Span. 116—Spanish Civilization and Culture 3
Span. 292—Pro-Seminar: Latin American Culture 3
Lang. 221 (C&I 125)—The Teaching of Foreign Languages 3

HOME ECONOMICS—Grades 4-8 28

Required Courses

Tx&Cl 124—Apparel Construction and Fitting 3
FIA 55—Food Principles and Practices 4
CD&FS 112—Toddler and Preschool Development 3
CD&FS 211—Middle Childhood-Early Adolescent Development 3
CD&FS 216—Child Development Practicum 3
HM&FE 161—Family Economics 3
ID & H 33—Housing and Design 3
Nutrn. 71—Introduction to Human Nutrition 3
H.E.Ed. 175—Methods of Teaching Home Economics 3

LANGUAGE ARTS—Grades 4-8 30

Required Courses 27

Rdng. 221—Developmental Reading 3
Rdng. 240—Corrective Language Arts Instruction 3
C&I 120—Elementary-Early Childhood Language Arts 3
L. Sci. 203—Literature for Children 3
Engl. 111—The English Language 3
Engl. 233 or Engl. 294 or L. Sci. 205 3
SPA 250—Speech-Language-Hearing: Development and Disorders 3
Rdng. 283—Workshop: Approaches to Teaching Literature 3
Engl. 295—Approaches to Teaching Composition 3
Approved English electives (select one from list below) 3
Engl. 103, 112, 125, 132, 133, 171, 220, 234, 235, and 240

MATHEMATICS—Grades 4-8 21

Required Courses 18

Math. 3—College Algebra 3
Math. 33, 34—Introductory Mathematics for Elementary Teachers 6
Math. 131—Algebra and Geometry for Elementary Teachers 3
Math. 226—Mathematical Statistics 3
C&I 337—Mathematics in the Middle School 3

	Required Sem. Hr.
Approved Electives	3
Math. 28—Finite Mathematics	3
Math. 41—Algorithmic Linear Algebra	3
Math. 128—Introduction to Calculus	3
Math. 133—Introductory Modern Algebra for Teachers	3
Math. 168—History of Mathematics	3
Math. 239—Elementary Number Theory	3
C.S. 1—Introduction to Computer Science	3

ORAL COMMUNICATION—Grades 4-8

Required Courses	21
Spch. 106—Nonverbal Communication	3
Spch. 11 and 12—Principles of Human Communication and Lab	3
Spch. 80—Introduction to Mass Media	3
SPA 250—Speech-Language-Hearing: Development-Disorders	3
Theat. 50—Oral Interpretation	3
Theat. 282—Creative Dramatics (May substitute Theat. 180 or 284)	3
SPA 80—Speech Improvement	3

SCIENCE—Grades 4-8	(minimum) 24
Required Courses	
P. Sci. 1, 2—Physical Science	8
Biol. 1, 2—General Biology	8
Geol. 2—Physical Geology Laboratory	1
Geol. 5—Introduction to Geology	3
Electives	(minimum) 4
Chem. 11, 12—Survey of Chemistry, or Biol. 252—Flora of West Virginia, or Phys. 1, 2—Introductory Physics, or Astro. 106—Descriptive Astronomy	

SOCIAL STUDIES—Grades 4-8	30
Required Courses	
S. Sci. 1—Introductory General Course	3
Hist. 52 and 53—Growth of the American Nation	6
Hist. 153—West Virginia, or	
Hist. 261—Economic and Social Development of West Virginia	3
Geog. 7—Physical Geography, or Geog. 8—Human Geography	3
Geog. 105—Resources, Conservation, and the Environment, or	
Geog. 109—Economic Geography	3
Pol. S. 2—American Federal System	3
Econ. 51—Principles of Economics	3
Soc. & A. 1 or 5 or 102 or 122	3
Electives in Economics, Geography, History, Political Science, or Sociology and Anthropology	3

MENTALLY RETARDED—Grades K-12

Required Courses	15
Sp. Ed. 250—Survey of Exceptional Children and Adults	3
Sp. Ed. 255—Introduction to Mental Retardation	3
Sp. Ed. 260—Curriculum and Methods for Special Education	3
Sp. Ed. 281—Special Problems and Workshop, or	
Rdng. 283—Reading and the Exceptional Child	3
SPA 250—Survey of Oral Communication Disorders	3

Students who wish to be certified to teach mentally retarded children and youth will earn 6 hours of student teaching at the elementary level and 6 hours in a program for the mentally retarded. *(See Professional Education requirements.)*

PROGRAMS FOR PROFESSIONAL CERTIFICATES JUNIOR AND SENIOR HIGH SCHOOL

Requirements for the Degree of Bachelor of Science in Secondary Education and for Recommendation for the Professional Certificate, Grades 7-12 or K-12

Lower-Division Work

In preparing for admission to the College of Human Resources and Education and the work of preparing for teaching in the junior and senior high school, students will register for the freshman and sophomore years in the College of Arts and Sciences and pursue their prescribed program in preparation for teacher certification under the direction of the pre-Education adviser.

Upper-Division Work

Upon completing 58 semester hours of approved college work a student is eligible to enter the College of Human Resources and Education. To become eligible for recommendation for the degree of Bachelor of Science in Education and for the Professional Certificate, Grades 7-12, the student must complete the requirements described in the General Requirements for the Professional Certificate. The College of Human Resources and Education will lend guidance and advice to students in any other department of the University who desire secondary teacher certification.

An overall grade-point average of 2.25 is required for admission to student teaching.

PROGRAMS FOR SECONDARY SCHOOL TEACHERS

	Required Sem. Hr.
1. GENERAL STUDIES	45-46
Required Courses	
Engl. 1 and 2—Composition and Rhetoric	6
Humanities	12
Literature	3
Appreciation or Survey of Fine Arts	3
Religious Studies, Philosophy, Humanities, Composition, Linguistics, Foreign Language	3
Electives in any area of Humanities	3
Science-Mathematics	11-12
(At least 3 semester hours in science and 3 semester hours in mathematics)	
Social Science	12
History	3-6
Multidisciplinary Studies, Sociology and Anthropology, *or* Social Science	3-6
Ed. F. 1	0-3
Physical Education and Health Education	4
School Health Education	2
General Physical Education	2

Required
Sem. Hr.

2. PROFESSIONAL EDUCATION—SECONDARY

Required Courses 32-35

Foundation for Teaching 8

C&I 7—Introduction to Education 2
Ed. P. 103—Human Development and Learning 3
Ed. P. 105—Human Development and Learning 3

Teaching Methods in Area of Specialization (To be scheduled with General Methods (below) and completed before student teaching semester.) 3-6

Select those related to teaching field:
C&I 124—Teaching Language Arts: Secondary School 3
C&I 134—Teaching Mathematics: Secondary School 3
C&I 144—Teaching Science: Secondary School 3
C&I 154—Teaching Social Studies: Secondary School 3
Ag. Ed. 160 (C&I 160)—Methods of High School Teaching of Agriculture 3
Art 165 (C&I 165)—Art Education in Elementary School 3
Art 166 (C&I 166)—Art Education in Secondary School 3
H.E.Ed. 175 (C&I 175)—Methods of Teaching Home Economics 3
H.E.Ed. 278 (C&I 278)—Vocational Home Economics 3
Lang. 221 (C&I 125)—Language Teaching Methods 3
Music 151 (C&I 167)—Music Education 3
Music 152 (C&I 168)—Music Education 3
P.P.E. 126—Physical Education, Grades K-6 4
P.P.E. 133 (C&I 174)—Physical Education, Grades 7-12 5
Spch. 201—Principles of Communication Education 3

General Methods 6

C&I 104—Principles of Teaching in Secondary Schools 4
Rdng. 222—Reading in the Content Areas 2

Practicum 15

Select according to teaching level and fields:
C&I 188—Secondary Student Teaching 12
C&I 187 *and* C&I 188—Elementary *and* Secondary Student Teaching (6 hours each) 12
C&I 188 *and* Sp. Ed. 280—Secondary Student Teaching *and* Special Education Student Teaching (6 hours each) 12
C&I 280—Workshop Problems—Student Teaching 3

3. TEACHING FIELDS—Grades 7-9, 7-12, and K-12

VOCATIONAL AGRICULTURE—Grades 7-12 (Single Teaching Field) 45

Required Courses—Core Program* 28

Ag. Ec. 104—Farm Management 3
Ag. Ed. 162—Group Organization and Leadership 2
Agr. M. 152—Shop Theory and Methods 3
Agr. M. 253—Advanced Farm Machinery, *or*
Agr. M. 259—Farm Structures, *or*
Agr. M. 270—Electricity in Agriculture, *or*
Agr. M. 275—Agricultural Engines 3
A&VS 51—Principles of Animal Science 4
Pl. Sc. 52—Principles of Plant Science 4
Agron. 2—Principles of Soil Science 4
Selected Agricultural Electives** 5

*Substitutions for core program courses may be made, if necessary, with equivalent courses and credit hours.

**Electives, to be selected in consultation with adviser, are based on individual student needs.

Credit hours selected from among available courses, in consultation with adviser, based on individual student needs.

Required
Sem. Hr.

Areas of Agricultural Minors (select one):

Agricultural Production and Management 17
Courses selected from among the following:***
An. Nu. 101; An. Pr. 108, 137, 138, 141, 142, 144, 145, 146, 240; Fd. Sc. 167; Vet. S. 102; F. Man. 132; Agron. 210, 212, 251, 252, 254; Ento. 204; Hort. 107, 115, 117, 204; P. Pth. 201; Ag. Ec. 206, 231, 235, 240; Agr. M. 253, 259, 270, 275; A&VS 180; Pl. Sc. 180; Res. M. 180.

Animal Processing 17
Courses selected from among the following.***
Fd. Sc. 106, 107, 112, 130, 134, 167, 267; Vet. S. 102; Bact. 141; An. Pr. 138, 139, 141, 145, 146, 240; A&VS 180.

Agricultural Mechanics 17
Courses selected from among the following:***
Agr. M. 152, 253, 259, 270, 275, 352; Agr. E. 280; I.E. 7, 8; Res. M. 180.

Agricultural Sales and Services 17
Courses selected from among the following:***
Ag. Ec. 10, 200, 231, 235, 240, 261, 330; Ag. Ed. 264; Mrktg. 111, 120; Res. M. 180.

Conservation 17
Courses selected from among the following:***
F. Man. 12, 122, 132, 151, 211; For. 140, 218, 219; Agron. 115, 210, 212, 250; L. Arc. 229; Rc. & Pk. 40, 142; Biol. 51; Wd. Sc. 121, 123, 130; Pl. Sc. 180.

Horticulture Produce Industry 17
Courses selected from among the following:***
Hort. 107, 115, 117, 204, 242, 243, 244, 245; P. Pth. 201; Ento. 204; Agron. 210; Pl. Sc. 180, 200, 201.

Ornamental Horticulture 17
Courses selected from among the following:***
Hort. 107, 116, 151, 162, 204, 245; Agron. 210, 250; L. Arc. 229; Ento. 204; P. Pth. 201; Pl. Sc. 180; Res. M. 180.

ART—Grades K-12 (Single Teaching Field) 54

Two-Dimensional Studio and Design 27
- Art 11, 12—Drawing 6
- Art 113, 114—Painting 6
- Art 121—Visual Foundation 3
- Art 123 *or* 124—Graphic Design 3
- Art 130 *or* 131 3
- Art 140 *or* 141 3
- Art 211—Figure Drawing 3

Three-Dimensional Studio and Design 12
- Art 122—Visual Foundation 3
- Art 126, 127—Modeling-Sculpture 6
- Art (Advanced Studio Elective) 3

Art History and Theory 12
- Art 105, 106—Survey of Art 6
- Art 165 (C&I 165)—Art Education in the Elementary School 3
- Art 166 (C&I 166)—Art Education in the Secondary School 3

Electives in Art 3
- Art Electives 3

***Credit hours selected from among available courses, in consultation with adviser, based on individual student needs.

Required
Sem. Hr.

ATHLETIC TRAINING—Grades 7-12 (To be combined with another teaching field) .. 36

(This is an experimental program previously listed.)

P.P.E. 121—Sport Injury Control and Management 3
P.P.E. 164—Kinesiology 3
P.P.E. 165—Physiology of Motor Activities 3
P.P.E. 176—Adapted Program in Physical Education 2
P.P.E. 220—Advanced Athletic Training 1 3
P.P.E. 221—Advanced Athletic Training 2 3
P.P.E. 222—Advanced Athletic Training 3 3
P.P.E. 223—Athletic Training Practice 3
P.P.E. 198—Special Topics: Human Anatomy, *or*
P.P.E. 219—Human Anatomy, *or*
Anat. 102—Gross Anatomy 3
P.P.E. 324—Issues in Athletic Training, *or*
Hl. Ed. 70—Health of the Individual 3
Saf. S. 70—First Aid and Emergency Care 3
Physi. 141—Elementary Physiology, *or*
Biol. 266—Human Physiology 4

ENGLISH—Grades 7-12 (To be combined with another specialization) 50

Engl. 1, 2—Composition and Rhetoric 6
Engl. 108—Advanced Composition (specially designated section) 3
Lingu. 1—Introduction to Language 3
Engl. 111—The English Language 3
Engl. 21, 22—English Literature Surveys 6
Engl. 24, 25—American Literature Surveys 6
Two 3-hour electives in English 6
Engl. 125—World Literature 3
Engl. 294—Fiction for Adolescents 3
Engl. 293—Practicum in Teaching Composition 1
Engl. 295—Approaches to Teaching Composition 3
C&I 224—Approaches to Teaching Language 2
C&I 225—Approaches to Teaching Literature 2
Approved elective in regional, ethnic, or minority literature 3

FOREIGN LANGUAGES—Grades 7-12

FRENCH (To be combined with another teaching field) 36

Required Courses

Frch. 1, 2—Elementary French 6
Frch. 3, 4—Intermediate French 6
Frch. 103, 104, 109, 110—Advanced French 12
Frch. 111—French Lit. from Middle Ages to Eighteenth Century 3
Frch. 112—La Lit francaise de Louis XV a de Gaulle 3
Frch. 217—French Civilization, *or*
Frch. 292—Pro-Seminar; French Culture 3
Frch. 231—Phonetics and Pronunciation, *or*
Lingu. 247—Structure of Modern French 3

GERMAN (To be combined with another teaching field) 36

Required Courses

Ger. 1, 2—Elementary German 6
Ger. 3, 4—Intermediate German 6
Ger. 103, 104, 109, 110—Advanced German 12
Ger. 265—German Civilization, *or*
Ger. 292—Pro-Seminar: German Culture 3

	Required Sem. Hr.
Lingu. 111—Introduction to Structural Linguistics, *or* Lingu. 257—Structure of German	3
Ger. 111—German Literature to 1832	3
Ger. 112—German Literature Since 1832	3
RUSSIAN (To be combined with another teaching field)	36
Required Courses	
Russ. 1, 2—Elementary Russian	6
Russ. 3, 4—Intermediate Russian	6
Russ. 103, 104, 109, 110—Advanced Russian	12
Russ. 144, 145—Survey of Russian Literature	6
Lingu. 111—Introduction to Structural Linguistics, *or* Lingu. 267—Structure of Russian	3
Russ. 292—Pro-Seminar: Russian Culture	3
SPANISH (To be combined with another teaching field)	36
Required Courses	
Span. 1, 2—Elementary Spanish	6
Span. 3, 4—Intermediate Spanish	6
Span. 103, 104, 109—Advanced Spanish	9
Span. 116—Spanish Civilization and Culture	3
Span. 117 and 118 or Span. 121 and 122	6
Span. 292—Pro-Semniar: Latin American Culture	3
Lingu. 111—Introduction to Structural Linguistics, *or* Lingu. 217—Structure of Spanish	3
LATIN (To be combined with another teaching field)	36
Required Courses	
Class. 1, 2—Elementary Latin	6
Class. 3—Intermediate Latin	3
Class. 4—Cicero's Orations	3
Class. 101—Greek and Roman Civilization and Culture	3
Class. 102—Greek and Roman Myths	3
Class. 109—Selections from Roman Prose	3
Class. 110—Selections from Roman Poetry	3
Lingu. 111—Introduction to Structural Linguistics	3
Approved Electives (Class. 201, 202, 235, 292)	9
HOME ECONOMICS—Grades 7-12 (Single Teaching Field)	47
Required Courses (Core)	15
CD&FS 12—Introduction to Marriage and the Family	3
Tx.&Cl. 124—Apparel Construction and Fitting, *or*, Tx.&Cl. 224—Flat Pattern Design	3
Nutrn. 71—Introduction to Nutrition	3
HM&FE 165—Home Management: Principles and Applications	3
ID&H 31—Introduction to Design	3
Required Courses	32
CD&FS 214—Family Development	3
CD&FS 216—Child Development Practicum	3
Tx.&Cl. 27—Introductory Textiles	3
Tx.&Cl. 121—Clothing for the Family	3
FIA 55—Food Principles and Practices	4
FIA 151—Meal Management	4
HM&FE 161—Family Economics	3
HM&FE 261—Consumer Economics	3
ID&H 33—Housing Design	3
HM&FE 167—Household Equipment	3

Required
Sem. Hr.

JOURNALISM—Grades 7-12 (To be combined with a 7-12 or K-12 teaching field) ... 21

Required Courses ... 21

Journ. 1—Introduction to Mass Communications ... 3
Journ. 18—News Writing ... 3
Journ. 19—Copy Editing and Make-up ... 3
Journ. 113—Principles of Advertising ... 3
Journ. 120—Introduction to Photography ... 3
Journ. 225—High School Publications Advising ... 3
Journ. 227—History of Journalism ... 3

MATHEMATICS—Grades 7-12 (To be combined with another teaching field) ... 30

Required Courses ... 24

Math. 15, 16, 17—Calculus ... 12
Math. 133—Introductory Algebra for Teachers ... 3
Math. 143—Introduction to Linear Algebra, *or*
Math. 241—Applied Linear Algebra ... 3
Math. 138—Modern Geometry for Teachers ... 3
Math. 226—Mathematical Statistics ... 3

Approved Electives ... 6

Math. 113—Differential Equations ... 3
Math. 123—Introduction to Numerical Procedures ... 3
Math. 163—Introduction to Concepts of Mathematics ... 3
Math. 168—History of Mathematics ... 3
Math. 181—Introduction to Analysis and Topology ... 3
Math. 215—Applied Modern Algebra ... 3
Math. 239—Elementary Number Theory ... 3
Math. 251—Introduction to Real Analysis ... 3
Math. 252—Introduction to Real Analysis ... 3
Math. 291—Theory of Probability ... 3
C.S. 1—Introduction to Computer Science ... 3

MENTALLY RETARDED, K-12 (Only for those combining with a 7-12 subject specialization)
(For the complete program, see the Special Education section.)

MUSIC—Grades K-12 (Single Teaching Field) ... 64-67

(Program outline also listed under Division of Music.)

Required Courses

Music 61-68—Music Theory ... 16
Music 44-47 (Instrumental Majors) *or* Music 48 (Vocal Majors) ... 3-8
Music 248—Music Arranging for Public School Groups ... 2
Music 31, 33, 34—Music Listening, Music History ... 7
Music 51, 52, 53—Conducting ... 6
Music 151, 152 (C&I 167, 168)—Music Education ... 6
Music 100-105—Major Performance Groups ... 4-5

(For instrumental emphasis majors, 5 hours must be in either Music 11, Band, or Music 103, Symphony Orchestra. For wind and percussion majors 1 hour must be in marching band. For vocal emphasis majors, 4 hours must be in either Music 102, Choral Union, or Music 105, Choir.)

Music 110—Applied Music (major performance medium) ... 12

(Students must achieve proficiency level 7)

Music 110—Applied Music (secondary voice and piano) ... 4-6

(Vocal emphasis majors must achieve proficiency level 3 in voice and proficiency level 3 in piano. Instrumental emphasis majors must achieve proficiency level 2 in piano.)

Required
Sem. Hr.

Required of Vocal Emphasis Majors Only:
Music 49—Vocal Pedagogy 2

Required of Instrumental Emphasis Majors Only:
Music 115—Chamber Music 1

ORAL COMMUNICATION—Grades 7-12 (To be combined with another teaching field) 36

Required Courses
Spch. 11 and 12—Human Communication and Laboratory 3
Spch. 80—Introduction to the Mass Media 3
Spch. 106—Non-Verbal Communication *or* Spch. 131—Human Communicaion and Language Behavior 3
Spch. 107—Communication and Decisions 3
Spch. 133—Interpersonal Communication 3
Spch. 180—Effects of Mass Communication 3
Spch. 201—Principles of Communication Education 3
Spch. 275—Communication Problems of Children, *or* SPA 250—Speech-Language-Hearing: Development-Disorders 3
Theat. 50—Oral Interpretation, *or* SPA 80—Speech Improvement: Theory and Performance 3
Theat. 74—Acting 3
Theat. 100—Stagecraft 3
Theat. 180—Directing 3

PHYSICAL EDUCATION K-12 and 7-12 (To be combined with another teaching field) 39-46

(Students who wish to be certified in physical education, Grades K-12, will do student teaching at the elementary and secondary levels.)

Theory and Foundations 24-31
S.E.S. 44—Sport and Movement Analysis 1
P.P.E. 70—Introduction to Physical Education 1
S.E.S. 72—Sociological and Psychological Perspectives of Sport 3
P.P.E. 75—Motor Learning 2
P.P.E. 110—Elementary Rhythms and Games (K-12 only) 2
P.P.E. 121—Sport Injury Control and Management 3
P.P.E. 126—Movement Education for Children (K-12 only) 4
P.P.E. 133 (C&I 174)—Methods of Teaching Physical Education 5
S.E.S. 164—Kinesiology 3
S.E.S. 165—Physiology of Motor Activities 3
P.P.E. 176—Adapted Program in Physical Education 2
S.E.S. 178—Historical and Philosophical Perspectives of Sport 2

Psychomotor—Sport and Movement Analysis 15

Team and Individual Sports (Student must elect 5 of the following.) 10
P.P.E. 45—Football, Baseball, Softball 2
P.P.E. 46—Volleyball, Soccer, Speedball 2
P.P.E. 47—Basketball, Field Hockey, Team Handball 2
P.P.E. 48—Tennis, Badminton, Golf 2
P.P.E. 49—Archery, Bowling, Fencing 2
P.P.E. 50—Wrestling, Weight Training, Track and Field 2

Aquatics (Students must elect 1 of the following.) 1
P.P.E. 57—Aquatics 1
P.P.E. 59—Synchronized Swimming 1
P.P.E. 124—Water Safety Instructorship 2

Required
Sem. Hr.

Dance (Student must elect 1 of the following.) 2

Dance 35—Theory and Practice of Modern Dance Techniques 2
Dance 37—Advanced Dance Techniques with Principles of Choreography 2
Dance 38—Dance Composition 2
Dance 39—Folk and Ballroom Dance 2

Gymnastics (Student must elect 1 of the following.) 2

P.P.E. 65—Gymnastics 2
P.P.E. 66—Advanced Gymnastics 2

SAFETY STUDIES—Grades 7-12 (To be combined with a 7-12 or K-12 specialization) . 18

Required Courses

Saf. S. 70—First Aid and Emergency Allied Services 3
Saf. S. 131—Accident Prevention Control Principles 3
Saf. S. 151—Driver and Highway Safety Foundations 3
Saf. S. 232—Safety Education Principles and Content 3
Saf. S. 254—Teaching Driver and Highway Safety 3
Saf. S. 256—Driver and Safety Instructional Innovations 3

SCHOOL LIBRARIAN—Grades K-12 (To be combined with another teaching field) 24

Required Courses

L. Sci. 190—Teaching Practicum, or L. Sci. 291—Advanced Study 3
L. Sci. 201—Reference and Bibliography 3
L. Sci. 203—Literature for Children 3
L. Sci. 205—Selection of Books and Related Materials for the Secondary School Library 3
L. Sci. 222—Field Practice 3
L. Sci. 223—Cataloging and Classification 3
L. Sci. 250—Administration of the School Library Media Center 3
Ed. P. 260—Instructional Media and Technology 3

SCIENCES

BIOLOGICAL SCIENCES—Grades 7-12 (To be combined with another teaching field) 30

(*Note:* Due to general public school hiring practices and because of the interrelationships of concepts in science, it is strongly recommended that students who wish a specialization in biological sciences take their second 7-12 specialization in mathematics, chemistry, physics, or general science.)

Required Courses 24

Biol. 1, 2—General Biology 8
Biol. 101—Animals As Organisms 4
Biol. 102—Plants As Organisms 4
Biol. 103—Population Biology 4
Biol. 104—Cellular and Molecular Biology 4

Approved Electives 6

For. 140—West Virginia's Natural Resources 3
Bact. 141—General Bacteriology 4
Chem. 15—Foundations of Chemistry 4
Chem. 16—Foundations of Chemistry 4
Phys. 1—Introductory Physics 4
Phys. 2—Introductory Physics 4
Geol. 1—Physical Geology 3

	Required Sem. Hr.
Geol. 2—Physical Geology	1
Geol. 3—Historical Geology	3
Geol. 4—Historical Geology	1
Biology—Any 200-level course other than Biol. 209	4

CHEMISTRY—Grades 7-12 (To be combined with another teaching field) 30

(*Note:* Due to general public school hiring practices and because of the interrelationships of concepts of science, it is strongly recommended that students who wish a specialization in chemistry take their second 7-12 specialization in mathematics, biology, physics, or general science.)

Required Courses	24
Chem. 15—Fundamentals of Chemistry	4
Chem. 16—Fundamentals of Chemistry	4
Chem. 115—Introductory Analytical Chemistry	4
Chem. 133-135—Organic Chemistry	4
Chem. 134-136—Organic Chemistry	4
Chem. 141-142—Physical Chemistry, *or* Chem. 246, 247—Introduction to Physical Chemistry	4
Approved Electives	6
Phys. 1—Introductory Physics	4
Phys. 2—Introductory Physics	4
Phys. 11—General Physics	4
Phys. 12—General Physics	4
Geol. 1—Physical Geology	3
Geol. 2—Physical Geology	1
Geol. 3—Historical Geology	3
Geol. 4—Historical Geology	1
Chem. 201—Chemistry Literature	2
Chem. 210—Instrumental Analysis	3
Chem. 235—Methods of Structure Determination	4

GENERAL SCIENCE—Grades 7-12 (To be combined with another teaching field) 35

Required Courses	35
Astro. 106—Descriptive Astronomy	3
Biol. 1—General Biology	4
Biol. 2—General Biology	4
Chem. 11 and 12—Survey of Chemistry, *or* Chem. 15 and 16—Foundations of Chemistry (If your second field is Chemistry)	8
Phys. 1 and 2—Introductory Physics, *or* Phys. 11 and 12—General Physics	8
Geol. 1—Physical Geology	3
Geol. 2—Physical Geology	1
Geol. 3—Historical Geology	3
Geol. 4—Historical Geology	1

PHYSICS—Grades 7-12 (To be combined with another teaching field) 28-30

(*Note:* Due to general public school hiring practices and because of the interrelationships of concepts in science, it is strongly recommended that students who wish a specialization in Physics take their second 7-12 specialization in mathematics, chemistry, biology, or general science.)

Either of the two programs below will satisfy the requirements for the 7-12 specialization in Physics.

	Required Sem. Hr.
Program A	30
Required Courses	21
(No Calculus prerequisite)	
Phys. 1—Introductory Physics	4
Phys. 2—Introductory Physics	4
Phys. 7—Physics of Music	3
Phys. 8—Light, Vision, and Color	3
Phys. 117—Descriptive Meteorology	3
Phys. 124—Introductory Modern Physics	4
Approved Electives	6
Astro. 106—Descriptive Astronomy, or Astro. 216—Astronomy for Teachers	3
Phys. 116—Photography, or Phys. 357—Photography	3
Phys. 263—Nuclear Physics	3
Phys. 313—Introductory Electronics	3
Phys. 354—Outline of Modern Physics	3
Phys. 355—Workshop for Physics Teachers	3
Chem. 15—Foundations of Chemistry	4
Chem. 16—Foundations of Chemistry	4
Math. 15—Calculus	4
Math. 16—Calculus	4
Geol. 1—Physical Geology	3
Geol. 2—Physical Geology	1
Geol. 3—Historical Geology	3
Geol. 4—Historical Geology	1
Program B	28-30
Required Courses	19
(Prerequisite: Math. 15 and 16)	
Phys. 11—General Physics	4
Phys. 12—General Physics	4
Phys. 124—Introductory Modern Physics	4
Phys. 231—Theoretical Mechanics	3
Phys. 233—Introductory Electricity and Magnetism	3
Phys. 241—Advanced Physics Laboratory	1
Approved Electives	9-11
Phys. 232—Theoretical Mechanics	3
Phys. 234—Introductory Electricity and Magnetism	3
Phys. 241—Advanced Physics Laboratory	2-4
Phys. 251—Introductory Quantum Mechanics	3
Phys. 263—Nuclear Physics	3
Phys. 271—Solid State Physics	3
Phys. 283—Thermodynamics	3
Chem. 15—Foundations of Chemistry	4
Chem. 16—Foundations of Chemistry	4
Geol. 1—Physical Geology	3
Geol. 2—Physical Geology	1
Geol. 3—Historical Geology	3
Geol. 4—Historical Geology	1

Required
Sem. Hr.

SOCIAL STUDIES—Grades 7-12 Comprehensive (Single Teaching Field) 54

Required Courses

Hist. 1, 2—Western Civilization 6
Hist. 52, 53—Growth of American Nation 6
Hist. 153—West Virginia, *or*
Hist. 261—Economic and Social Development of West Virginia 3
Geog. 7—Physical Geography 3
Geog. 8—Human Geography 3
Select one course from Geog. 109, 140, 141, 142, 143, 144, 145 3
Econ. 51—The Economic System 3
Econ. 55—Principles of Economics 3
Pol. S. 1, *or* 120, *or* 160, *or* 221 3
Pol. S. 2—American Federal System 3
Soc. & A. 1, *or* 5, *or* 102 3
Soc. & A. 140—Social Change in Appalachia 3
Soc. & A. 122, *or* 135, *or* 222 3
Electives in History, Geography, Sociology and Anthropology,
Political Science, Economics, or Psychology 1 9

SOCIAL STUDIES—Grades 7-9 (Combined with K-12 or 7-12 specialization) 24

Required Courses

Hist. 52, 53—Growth of the American Nation 6
Hist. 153—West Virginia History, *or*
Hist. 261—Economic and Social Development of West Virginia 3
Geog. 7—Physical Geography, *or*
Geog. 8—Human Geography 3
Geog. 109—Economic Geography, *or*
Geog. 140—Geography of the United States and Canada 3
Pol. S. 2—American Federal System 3
Econ. 51—Principles of Economics 3
Soc. & A. 1—Introduction to Sociology, *or* Soc. & A. 5—Introduction
to Anthropology, *or*
Soc. & A. 102—Social Problems, *or* Soc. & A. 122—The Community 3

Courses of Instruction

C&I 7 is a prerequisite to all other courses in Education.

No courses in Education, except C&I 7, Ed. P. 103 and 105, and Ed. F. 1, are open to sophomores.

Behavior Analysis of Human Resources (BAHR)

260. *Media and Microcomputers in Instruction.* I, II, S. 3 hr. The effective operation and educational uses of educational media including microcomputers. Hands-on experience with equipment, and in designing materials for an instructional unit incorporating media and/or microcomputers.

Curriculum and Instruction (C&I)

7. *Introduction to Education.* I, II, S. 2 hr. Concepts underlying the educational system in the American society. Gives the student experience in identifying the student's values, attitude, and feelings with those of today's community and youth. Includes a required field experience. *(Speech and hearing screening required.)*

100. *Elementary-Early Childhood General Methods.* I, II. 3 hr. PR: C&I 7 and 120, Ed. P. 103, 105, Rdng. 221 or 222. Introduction to Education, including analysis of professional problems and procedures in school systems. Includes a required field experience. *(This course is a part of the pre-student teaching block which consists of C&I 130, 140, 150, and Rdng. 250.)*

104. *Principles of Teaching in Secondary Schools.* I, II, S. 4 hr. General professional education course emphasizing methods applicable to all academic areas. *(Not available to undergraduates during Summer.)*

120. *Elementary-Early Childhood Language Arts.* I, II, S. 3 hr. PR: C&I 7. Conc.: Rdng. 221. Instructional practice to develop communication skills of listening, speaking, and writing.

124. *Teaching Language Arts: Secondary School.* I, II. 3 hr. Includes an examination and application of relevant curricular materials and teaching techniques.

125. *Foreign Language.* I, II, S. 3 hr. Methods and materials in the secondary school. *(Also listed as Foreign Language 221.)*

126. *Library Science.* I, II. 2 hr. Methods and materials of high school teaching.

130. *Elementary-Early Childhood Mathematics.* I, II. 3 hr. PR: Math. 131, C&I 120, Ed. P. 103, 105, Rdng. 221 or 222. Materials and methods for teaching mathematics emphasizing manipulative devices and activity learning for development of mathematical concepts. Field experience required. *(To be taken with C&I 100, 140, 150 and Rdng. 240.)*

134. *Teaching Mathematics: Secondary School.* I, II. 3 hr. Includes an examination and application of relevant curricular materials and teaching techniques.

140. *Elementary-Early Childhood Science.* I, II. 3 hr. PR: P. Sci. 1, 2, Biol. 1 or 2, C&I 120, Ed. P. 103 and 105, Rdng. 221 or 222. Modern methods and materials for teaching science with emphasis on investigative skills and attitudes. Includes a required field experience. *(To be taken concurrently with C&I 100, 130, 150 and Rdng. 240.)*

144. *Teaching Science: Secondary School.* I, II. 3 hr. Includes an examination and application of relevant curricular materials and teaching techniques.

150. *Elementary-Early Childhood Social Studies.* I, II. 3 hr. PR: 12 hr. Social Studies, C&I 120, Ed. P. 103 and 105, Rdng. 221 or 222. Study of materials and activity-oriented procedures for teaching of social studies. Includes a required field experience. *(To be taken with the pre-student block which consists of C&I 100, 130, 140 and Rdng. 240.)*

154. *Teaching Social Studies: Secondary School.* I, II. 3 hr. Includes an examination and application of relevant curricular materials and teaching techniques.

160. *Vocational Agriculture.* I, II. 3 hr. Methods and materials of high school teaching. *(Also listed as Ag. Ed. 160.)*

165. *Art Education in the Elementary School.* I. 3 hr. *(Also listed as Art 165.)*

166. *Art Education in the Secondary School.* II. 3 hr. *(Also listed as Art 166.)*

167. *Materials and Methods in Elementary School Music.* I, II. 3 hr. *(Also listed as Music 151.)*

168. *Music Education.* I, II, S. 3 hr. Methods and materials in secondary school music. *(Also listed as Music 152.)*

174. *Physical Education.* I, II. 3 hr. Methods of teaching physical education. *(Also listed as P.P.E. 133.)*

175. *Home Economics.* I, II. 3 hr. Methods and materials of high school teaching. *(Also listed as CD&FR 175.)*

187. *Student Teaching: Elementary-Early Childhood.* I, II. 4-12 hr. PR: For elementary and early childhood undergraduates who meet eligibility requirements and other guidelines. (Applicable to preschool, nursery, day care, child care, kindergarten, primary grade, or elementary school.) Experiences with children 3-5 years of age are required of all students in Early Childhood.
   1. At the time of application for student teaching have a minimum overall grade-point average of 2.25 and a 2.0 average in both specialization and education course work. The above requirements must also be met at the beginning of the student teaching semester.
   2. Have completed all courses in education and three-fourths of course work required in area of specialization before the student teaching semester.
   3. Submit positive evidence that the applicant meets requirements of physical condition and emotional stability necessary for performance of duties as a teacher.
   4. Exhibit reading, writing, speaking, and hearing proficiencies necessary for the teaching profession. Remediation will be required before student teaching for those who do not demonstrate acceptable competencies.
   5. Admission is by application made before March 1 of the preceding year to the Director of Student Teaching.
   6. Additional courses may not be taken with student teaching block.
   7. Student teaching will be done in selected centers throughout the state. Therefore, students should be prepared to live off-campus if so assigned. *NOTE:* Students must avoid employment, social commitments, or housing contracts which would interfere with an off-campus assisgnment.

188. *Student Teaching: Secondary Education.* I, II. 4-12 hr. PR: Students enrolled in Secondary Education undergraduate programs who meet eligibility requirements and other guidelines:
   1. At the time of application for student teaching have a minimum overall grade-point average of a 2.25, 2.0 average in course work in the teaching fields, and 2.0 average in education course work. The above requirements must also be met at the beginning of the student teaching semester.
   2. Have completed all courses in education and three-fourths of course work required in each teaching field before the student teaching semester.
   3. Submit positive evidence that the applicant meets requirements of physical condition and emotional stability necessary for performance of duties of a teacher.
   4. Exhibit reading, writing, speaking, and hearing proficiencies necessary for the teaching profession. Remediation will be required before student teaching for those who do not demonstrate acceptable competencies.
   5. Admission is by application made before March 1 of the preceding year to the Director of Student Teaching.
   6. Additional courses may not be taken with student teaching block.
   7. Student teaching will be done in selected centers throughout the state. Therefore, students should be prepared to live off campus if so assigned. *NOTE:* Students must avoid employment, social commitments, or housing contracts which would interfere with an off-campus assignment.

205. *The Junior High School.* I, II, S. 2 hr. PR: Consent. Developing philosophy, program, and practices of the junior high school.

210. *Early Childhood Education 1.* I, II, S. 3 hr. PR: CD&FS 216, Ed. P. 103 or 105. *(A field experience with children 3-5 years of age is required.)* Introduction to methods and materials in early childhhood education curriculum instruction and program organization, development and evaluation. The content of this course is applicable to field placement in a preschool, nursery school, day care, and/or childhood care center.

211. *Early Childhhood Education 2.* I, II, S. 3 hr. PR: CD&FS 216, Ed. P. 103 or 105. *(A field experience with children 3-5 years of age is required.)* This course is designed for individuals who will be working with early childhood programs for children under eight years of age. The various aspects of early childhood education are studied in relationship to organizational and administrative structures. This includes planning, budgeting, staffing, supervising, and evaluating comprehensive learning facilities for young children.

212. *Methods in Preschool Education.* I. 3 hr. PR: Ed. F. 1 or C&I 7 or equiv. Development of an experiential model of teaching young children. Application of methods in basic needs areas of nursery-early childhood education consistent with an experiential model of teaching.

214. *Creative Experiences in Early Childhood.* II. 3 hr. PR: Ed. F. 1 or C&I 7 or equiv. Examination of creative experiences for young children and their relationship to child development. A special focus on play behavior as a learning medium with emphasis on program planning, curriculum development, and instructional strategies.

216. *Early Language and Communication Experiences.* I. 3 hr. PR: Ed. F. 1 or C&I 7 or equiv. Presents activities for developing language and communication skills in children 2-5 years of age. Covers a broad range of temporary and enduring forms of communication in visible and audible media.

218. *Management of Preschool Education.* II. (Alternate Years.) 3 hr. PR: Ed. F. 1 or C&I 7 or equiv. Planning, designing, and assessing programs for children ages 2-5 years with emphasis on management skills. *(A field experience with children 2-5 years of age is required.)*

224. *Approaches to Teaching Language.* II. 2 hr. PR: Lingu. 1 and Engl. 2. Designed for prospective teachers of English and language arts. Focus is upon planning and implementing methods of teaching English as a language. Materials and resources appropriate for public school instruction are analyzed and utilized.

225. *Approaches to Teaching Literature.* II. 2 hr. PR: Junior standing. Designed for prospective teachers of English and language arts. Course focuses upon methodologies for teaching literature in public schools. Workshop format will provide opportunities for peer teaching activities as students apply methods of teaching literature.

267. *The Music Education Program.* S. 3 hr. PR: Consent. Organization and administration of the complete music education program for grades 1-12.

278. *Vocational Home Economics in Secondary Schools.* I. 3 hr. PR: Ed. P. 103.

280. *Special Problems and Workshops.* I, II, S. 2-4 hr. *(Maximum of 8 semester hours may be applied toward the master's degree.)* PR: 14 hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

287. *Advanced Clinical Experience.* I, II, S. 1-6 hr. PR: Consent. Clinical experience in teaching-learning situations at any level.

Education Foundations (Ed. F.)

1. *Education in the American Culture.* I, II. 3 hr. How American pluralistic culture perpetuates itself through formal and informal education. The educative role of families, media, arts, pressure groups, government, and schools is investigated by instruction in history and social science concepts and techniques.

Educational Psychology (Ed. P.)

103. *Human Development and Learning.* I, II, S. 3 hr. Emphasis on development, standardized measurement, and classroom management.

105. *Human Development and Learning.* I, II, S. 3 hr. Emphasizes competencies in applying principles of learning and measurement in classroom instruction.

231. *Sampling Methods.* I. 3 hr. PR: An introductory course in statistics. Methods of sampling from finite and infinite populations, choice of sampling unit, sample survey design, estimation of confidence limits and optimum sample size, and single and multi-stage sampling procedures. *(Also listed as Stat. 231.) (Course will not be offered in 1983-84.)*

269. *Behavioral Technology for Education.* I, II, S. 3 hr. PR: Ed. P. 105 recommended. Behavioral science applied to instructional systems. Complex systems; feedback loops; measuring relevant variables, collecting data. Applying schedules of reinforcement. Effective stimulus control for students, teachers, and administrators. Relationship between system and institution. Behavioral ethics. *(Course will not be offered in 1983-84.)*

Health Education

The following service courses are offered. Teacher certification in health education is not available at the undergraduate level.

Health Education (Hl. Ed.)

50. *History and Philosophy of Health Education.* I, II, S. 3 hr. Provides the student with an historical perspective of health education's development, its present status, and its current philosophical foundations.

70. *Health of the Individual.* I, II, S. 3 hr. Examines personal health-related problems in terms of information, services, and action, as they relate to attainment and maintenance of individual health.

71. *Health in the Community.* I, II, S. 3 hr. Develops an understanding of the organization, structure, and function of official, voluntary, and professional community health components in terms of their protecting and maintaining the health of the individual and the community.

101. *Elementary School Health Program.* I, II, S. 2 hr. PR: Ed. P. 103 or 105 and junior or senior standing. The organization, educational aspects, and personnel relationships involved in school health services, healthful school living, and health education.

102. *Secondary School Health Program.* I, II, S. 2 hr. PR: Ed. P. 103 or 105 and junior or senior standing. The organization, educational aspects, and personnel relationships involved in school health services, healthful school living, and health education.

220. *Drug and Alcohol Abuse Prevention.* I, II. 3 hr. Experiences designed to prevent the development of abusive drug-taking relationships by focusing on psychological variables such as self-esteem, coping skills, and development of support networks.

290. *Women and Health.* I, II. 3 hr. Examination of theories, myths, and practices surrounding women's physical and mental health from both historical and present-day perspectives. Exploration of issues and controversies and the rise of the women's health movement.

Reading

At the undergraduate level, reading is primarily a service area to students in early childhood education, elementary education, secondary education, and special education. There are no specializations which an undergraduate can pursue.

Reading (Rdng.)

221. *Developmental Reading.* I, II, S. 3 hr. PR: Consent. Fundamentals of reading instruction. Emphasizes classroom organization and teaching techniques.

222. *Reading in the Content Areas.* I, II. 2 hr. Skills and strategies needed by content area teachers to reinforce the reading skills necessary for the effective learning of secondary students in the content areas.

240. *Corrective Language Arts Techniques.* I, II. 3 hr. PR: Rdng. 221, consent. Fundamentals of informal language arts diagnosis and corrective classroom language arts instruction. A practicum for the utilization of informal diagnosis and corrective techniques.

283. *Special Workshop in Reading.* I, II, S. 1-6 hr. For elementary and secondary students in preservice education programs, as well as elementary and secondary teachers in inservice education.

Family Resources

Family Resources prepares students who are interested in obtaining undergraduate professional preparation in the broad field more commonly known as home economics. The courses provide opportunities to study our environment, particularly our food, clothing and shelter, and our relationship to the environment. The focus is on human interaction and its consequences within the framework of the social institution of the family.

Preparation for the following career opportunities are possible by enrollment in the Department of Family Resources:

Child development, nursery education, family life education, child welfare, family service occupations, and other community service fields.

Management and effective use of family financial and human resources.

Interior design.

Textile and apparel industry, fashion, and fashion merchandising.

Human nutrition, nutrition education, food service.

Teaching vocational home economics in grades 7 through 12.

Community involvement with social agencies, extension, journalism, business and general home economics.

Large industrial organizations whose major products are food.

Dietetics.

The need to educate competent and informed citizens and family members has never been more urgent. Family Resources provides not only lectures but also a variety of laboratory experiences and selected field experiences to help students accomplish the goals of their ventures. Home economics has the longest tradition of any field for interest in the education of competent and informed consumers and family members.

Students have a choice of seven areas of study leading toward a degree in Family Resources. These include: child development, dietetics, food service management, home economics education, community involvement, interior design, textiles, clothing and fashion merchandising. Certification is offered in Home Economics Education (Grades 4-8, Grades 7-12).

The degree of Bachelor of Science in Family Resources is granted following completion of a minimum total of 129 hours, including a minimum of 58 upper-division hours.

The 129 hours include Fam. R. 1—Introduction to Family Resources—which is required of all freshman students in the first semester.

Required Courses *Hr.*

I. University Core Curriculum
English Composition 6
University Core Groups A, B, and C 36
Total 42

II. Family Resources Professional Core
1. Child Development and Family Studies 3
2. Textiles and Clothing 3
3. Nutrition 3
4. Home Management and Family Economics 3
5. Interior Design and Housing 3
6. Family Resources 1 1
Total 16

III. Programs
a. Child Development and Family Studies
1. Required courses in Child Development and Family Studies 35
2. General electives 36
Total 71

b. Interior Design
1. Required courses in Interior Design 36
2. Additional courses in art, journalism, marketing, textiles, and speech pathology and audiology 24
3. General electives 11
Total 71

c. Textiles and Clothing
1. Required courses in Family Resources 27
2. Required general courses 15
3. Electives (restricted choice) 15
4. General electives 8-14
Total 71

d. Home Economics Education and Community Involvement (Teacher Certification) (Grades 7-12)

Students wishing a vocational teaching certificate and degree must take specified courses in the University Core Curriculum and at least 9 hours in each of the five subject-matter areas in Family Resources. *(See Programs for Secondary School Teachers under Education.)*

(Community Involvement)
Students wishing to major in Community Involvement with social agencies, Extension, General Home Economics, and Business must take the University Core Curriculum, Family Resources core, and recommended electives to support the area chosen for emphasis.

1. Family Resources Core 19
2. Electives in Family Resources (restricted choice) 32
3. Required Emphasis courses 30
4. General electives 0-9
5. Practicum 3-12
Total 84

e. Dietetics, Nutrition, and Foods and Institutional Administration

Two options in dietetics fulfill the academic requirements of the American Dietetic Association. After obtaining the B.S. degree with a dietetics option, students must enroll in a dietetic internship or gain other experience approved by the American Dietetic Association in order to be eligible for the Registration Examination.

In addition to the University Core Curriculum, some courses of which are specified by the programs, students must take:

(General Dietetics)

1. Family Resources Core 17
   (Three of these courses are required.)
2. Additional requirements in sciences, management, math, and learning theory 28
3. Required professional courses in Foods and Institutional Administration and Nutrition 27
4. General Electives 25

Total 94

(Management)

1. Family Resources Core 17
   (Four of these courses are required.)
2. Additional required courses in business, management, accounting, and biological sciences 28
3. Required professional courses in Foods and Institutional Administration 29
4. Electives 13-15

Total 87-89

Students can emphasize areas in food service management, foods, or nutrition. These areas have fewer specific requirements but do not meet all academic requirements for entrance into an approved dietetic internship.

Courses of Instruction in Family Resources

(Where a pink permit card is required to register for a course offered by Family Resources, it may be given only by the instructor or the chairperson.)

Child Development and Family Studies (CD&FS)

10. *Introduction to Child Development.* I, II. 3 hr. Introduction of the major explanations (i.e., theories) and concepts in the study of child development which will be integrated in an analysis of children's physical, cognitive, and social development.

11. *Child Development Observation Laboratory.* I, II. 1 hr. Conc.: CD&FS 10. PR: CD&FS majors only or consent. Observation and application of child development information presented in CD&FS 10.

12. *Introduction to Marriage and the Family.* I, II. 3 hr. Study of dating patterns, mate selection, premarital relationships, and early marital adjustment. Focus on problem solving and communication between partners.

110. *Introduction to Parenting.* I. 3 hr. Introduction of terminology, descriptions, and explanations of the parental role and parent-child interactions. Emphasis on social and personal definitions of the parental role and on the problems and changes in parent-child relationships.

111. *Infant Development.* II. 3 hr. PR: CD&FS 10. Developmental characteristics and environmental effects on the child during the prenatal period and the first two years with implications for guidance and care.

112. *Toddler and Preschool Development.* I. 3 hr. PR: CD&FS 10 or consent. Physical, social, emotional, and cognitive development of children ranging from 18 months to 6 years with implications for guidance and care.

211. *Middle Childhood-Early Adolescent Development.* II. 3 hr. PR: CD&FS 10. Analysis and investigation of developmental factors in middle childhood-early adolescence. Consideration and diagnosis of physical, emotional, social, familial, moral, and intellectual interactions affecting the child 6-14.

212. *Adolescent Development.* I. 3 hr. PR: CD&FS 10. Adolescent in contemporary American culture, including normative physical, social, and personality development; relationships within various typical social settings. (e.g., family, school, community, peer group).

213. *Contemporary Issues in Family Relations.* II. 3 hr. Study of recent research findings in the major areas of family relationships. Topics include effects of divorce upon children, impact of employment upon the marital relationship, and spousal violence.

214. *Family Development.* I. 3 hr. The contemporary family from formation of material unit to death of both spouses. Special attention to the use of the family life cycle and developmental tasks.

215. *Parenting Strategies.* II. 3 hr. PR: Senior or graduate standing or consent. Focus on the interactions between parent and child. Analysis of typical problems which occur in parenting. Deals solely with normal daily situations which often occur in the home.

216. *Child Development Practicum.* I, II. 3-4 hr. PR: CD&FS 112 or consent. Application of child development principles. Involves planning developmentally appropriate activities for 3- and 4-year-old children at the University Child Development Laboratory.

219. *The Growing Years.* I, II. 3 hr. A televised course offered primarily for off-campus students to become familiar with development of children during their growing years. How to recognize the diversity of approaches in child development research and theory.

284. *Special Topics in Child Development.* I, S. 1-4 hr. per sem. PR: Written consent.

288. *Special Topics in Family Relations.* II, S. 1-4 hr. per sem. PR: Written consent.

Family Resources (Fam. R.)

1. *Introduction to Family Resources.* I, II. 1 hr. Exploration of career possibilities in the six major professional emphasis areas of family resources to enable students to make best possible class selections.

211. *Community Internship.* I, II, S. 3-12 hr. PR: H.E. Ed. 281 or consent. Supervised participation in the family resources field, in settings such as business and industry; government bureaus; communication and media; social service and health agencies.

282. *Seminar in Clothing or Textiles.* I, II, S. 1-4 hr. per sem.; max. credit, 9 hr. PR: Written consent. Significant contemporary issues in clothing or textiles.

283. *Seminar in Interior Design and Housing.* I, II, S. 1-4 hr. per sem.; max. credit, 9 hr. PR: Written consent; 12 hr. housing and design courses. Significant contemporary issues in housing or design.

285. *Seminar in Food and/or Institution Administration.* I, II, S. 1-4 hr. per sem.; max. credit, 9 hr. PR: Written consent. Significant contemporary issues in foods and/or institution administration.

286. *Seminar in Home Management or Family Economics.* I, II, S. 1-4 hr. per. sem.; max. credit, 9 hr. PR: Written consent. Significant contemporary issues in home management or family economics.

Foods and Institution Administration (FIA)

55. *Food Principles and Practices.* I. 4 hr. Basic principles of the science of food preparation. Emphasis on understanding the reasons for basic practices and procedures essential for obtaining a standard product and on function of ingredients.

151. *Meal Management.* II. 4 hr. PR: FIA 55, Nutrn. 71. Management of time, energy, money, and other human resources in planning and preparing nutritionally adequate meals within the family setting.

153. *Quantity Food Production Systems 1.* I. 4 hr. PR: FIA 55, 151. Study of basic concepts and application of basic principles in quantity food procurement, processing, and service; standardized procedures, specifications, and bid buying for supplies and equipment.

154. *Food Systems Equipment; Layout, Design.* II. 3 hr. PR: FIA 153 and consent. Basic principles in the design and layout of various food service operations; principles governing the purchase, use, and operation of equipment. Field trips and clinical experience. *(Offered in odd years.)*

158. *Personnel Functions in Food Service.* II. 3 hr. PR: FIA 153; Manag. 105. Personnel functions in large-scale food service systems.

254. *Experimental Foods.* II. 3 hr. PR: FIA 55, organic chemistry or consent. A study of the basic chemical processes that occur within food systems including the effects of storage, processing, and alterations in formulation on the overall quality of food products.

257. *Food, Labor, and Cost Control.* II. 3 hr. PR: FIA 153, Acctg. 51. Food systems accounting and cost control. Techniques for analyzing, managing, and controlling food and labor costs. *(Offered in even years.)*

258. *Food Systems Management Practicum.* II. 4 hr. PR: FIA 153 and consent. Ten weeks or 400 hours of practical experience in operations of the type in which the student is majoring.

Home Economics Education (H.E.Ed.)

175. *Methods of Teaching Home Economics.* I, II. 3 hr. To be taken the semester or year before student teaching. Planning, implementing. and evaluating teaching-learning experiences in a supportive learning environment.

219. *Occupational Home Economics.* II. 3 hr. Prepares teachers to implement occupational home economics programs. Emphasis on organizing and administering programs, developing laboratory and work experiences, recruiting students, and evaluating progress.

278. *Vocational Home Economics.* II. 3 hr. PR: Senior standing or consent. Develops an understanding of federal vocational legislation to enable an individual to develop program proposals and implement programs in vocational education.

281. *Contemporary Problems in Home Economics.* I. 3 hr. Applies the broad-based philosophy of home economics to current individual family and community problems, e.g., societal impact on families, changing consumer market, changing roles, day care, diminishing energy resources, career education, etc.

284. *Special Topics.* I, II, S. 3 hr. Individual or group research on a current concern in the field of home economics.

Home Management and Family Economics (HM&FE)

160. *Communication of Consumer Information.* I, II. 3 hr. *(Open to all students.)* Introductory experiences to develop public communication skills through live and mediated presentations that meet the informational needs of consumers.

161. *Family Economics.* I, II. 3 hr. Management of the family's money resources. Consideration of economic problems, planned spending and saving, and the consumer's role.

165. *Home Management: Principles and Applications.* I, II. 3 hr. *(Open to all students.)* Personally meaningful examination of the management process as it contributes to the development and effective use of human and non-human resources in the achievement of personal satisfaction in a changing world.

167. *Household Equipment.* I, II. 3 hr. *(Open to all students.)* A consumer approach to evaluating portable and major household equipment with a focus on concern for: energy efficiency, safety, task performance, ecological impact, and use and care. *(Course not offered Spring, 1983-84.)*

261. *Consumer Economics.* II. 3 hr. Understanding the consumer's role in our economy. Study of research methods and techniques used to identify, understand, and solve consumer problems.

262. *Introduction to Homemaker Rehabilitation.* II. 3 hr. PR: Consent. A comprehensive coverage of the historical development, philosophy, legislation, community resources, research and professional literature provides a base of knowledge needed by the student to enter the field of homemaker rehabilitation.

Interior Design and Housing (ID&H)

31. *Introduction to Design.* I, II. 3 hr. Survey of the varied areas of design with an emphasis on analyzing and evaluating the aesthetic and functional qualities of each.

32. *Interior Design Graphics 1.* II. 3 hr. Various presentation media and techniques used to provide communication skills such as drafting, rendering, perspective drawing, and layout organization for professional graphic presentation.

33. *Housing Design.* I, II. 3 hr. PR: ID&H 31 or consent. Housing and home planning. Selection, arrangement, and use of interior and exterior space for activities carried on, in, and around the home.

34. *Interior Design Graphics 2.* I. 3 hr. PR: ID&H 32. Study and application of color theory and techniques for use in graphic presentations. Special emphasis on the aesthetic and practical aspects of interior design.

35. *Interior Design and Housing.* II, S. 3 hr. PR: ID&H 31 or consent. A practical course in which the student becomes familiar with the fundamentals of interior design through work with floor plans, furniture selection and arrangements.

133. *Interior Design.* I, II. 3 hr. PR: ID&H 34. Study and application of the functional aspects of interior design through problem solving situations and extensive presentation work.

136. *Contract Design.* I. 3 hr. PR: ID&H 133. A studio course which will emphasize the contract aspects of the interior design field. The design of public spaces with particular emphasis on office planning and design as a work environment.

137. *Professional Practices for Interior Designers.* II. 3 hr. PR: ID&H 133. The relationships between the management/marketing functions and the design process. A problem solving approach to all the activities which contribute to the completion of an interior design installation.

233. *Decorative Arts 1.* I. 3 hr. PR: 9 hr. housing and design courses. The decorative arts—antiquity to American periods.

234. *Decorative Arts 2.* II. 3 hr. PR: ID&H 233. The decorative arts—American periods to present.

235. *Contemporary Interior Design.* I. 3 hr. PR: ID&H 234. Study of the history of interiors, 1900-present.

238. *Portfolio Design.* I, II, S. 3 hr. PR: Senior standing. Development and preparation of a portfolio for interior design and National Council for Interior Design Qualification examination.

239. *Interior Design Field Experience.* I, II, S. 3-9 hr. (May be repeated to 9 hr.) PR: Written consent, senior standing. Opportunity to learn and work within a professional environment with practicing designers.

Nutrition (Nutrn.)

71. *Introduction to Human Nutrition.* I, II. 3 hr. Nutrient structure, metabolism, integrated function and their importance to human well-being during all stages of the life cycle. Current concerns and those of special interest to college students in meeting nutrient needs.

172. *Contemporary Issues in Nutrition.* I. 3 hr. PR: Nutrn. 71. Contemporary issues in nutrition including a critical review of food practices and recent trends in nutrition.

179. *Introduction to Dietetics.* I. 1 hr. PR: Admission in Coordinated Undergraduate Dietetic Program. Introduction to philosophy, goals, role expectations, sequencing of courses and competencies expected. Emphasis is on enabling the student to develop a clear understanding of the professional development expected and the implied responsibilities.

260. *Human Nutrition.* I. 3 hr. PR: Nutrn. 71, physiology. Coreq.: Biochemistry; Nutrn 261. Role of food nutrients in physiological and biochemical processes of the body; nutritional needs of healthy individuals under ordinary conditions.

261. *Nutrition Laboratory Experimentation.* I. 1 hr. Coreq.: Nutrn. 260 or consent. Nutrient analysis and introduction to nutrition experimentation.

270. *Nutrition Education.* I. 2 hr. PR: Nutrn. 71, 3 hr. in educational psychology and consent. Problems and methods in nutrition education at all levels of society, and with various types of individuals and groups.

272. *Community Nutrition 1.* II. 2-3 hr. PR: Nutrn. 71. Beginning planning for community nutrition for individuals and families at various stages of the life cycle. Roles of concerned agencies and professional groups. Clinical experience in community facilities for the third credit-hour is optional.

274. *Nutrition in Disease.* II. 4 hr. PR: Nutrn. 71; physiology or consent; biochemistry required for dietetics majors. Nutritional care aspects of patients. Modification of diet to meet human nutrition needs in various clinical conditions.

279. *Dietetics As a Profession.* I. 1 hr. PR: Senior standing. Discussion of the profession of dietetics and the professional organization, American Dietetic Association (ADA). Completion of materials to meet ADA membership requirements.

370. *Human Nutrition Concepts and Application.* II. 3 hr. PR: Nutrn. 260 or equiv., and consent. Critical study of the nutrient evaluation methods and the nutrient requirements of the human in health and disease, and scope of its application.

Textiles and Clothing (Tx.&Cl.)

27. *Introductory Textiles.* I, II. 3 hr. Traditional background information and new developments in textiles. Special emphasis on development of raw materials into finished consumer goods.

121. *Clothing for the Family.* I, II. 3 hr. Clothing in relation to social, psychological, and economic factors, including a study of the clothing industry, trends, and cultural significance. Field trip included.

124. *Apparel Construction and Fitting.* II. 3 hr. PR: Tx.&Cl. 27 and sophomore standing. *(Textiles, Clothing and Home Economics Education majors only.)* Basic principles of apparel construction, pattern alteration, and fitting. Discussion of the differences in the quality of construction of ready-to-wear and couture apparel.

126. *History of Costume/Apparel Design.* I. 3 hr. PR: Tx.&Cl. 27, 124. A study of history of costume from the Egyptians to the present day. Beginning figure and fashion designing included, using historical garments as a basis for contemporary design.

127. *Consumer Textiles.* II. 3 hr. PR: Tx.&Cl. 27. Discussion and examination of household textile products. Review of textile legislation and marketing strategies related to consumer protection and satisfaction.

221. *Socio/Psychological, Cultural Aspects of Dress.* II. 3 hr. PR: Tx.&Cl. 121 and senior standing or consent. A study of writings and research in the social, psychological, and cultural factors affecting clothing choices historically and contemporarily. Original research will be conducted by each student.

222. *Fashion Merchandising.* II. 3 hr. PR: Tx.&Cl. 121 and junior standing. Emphasis is placed on merchandising activities performed on the retail level, including planning sales and assortments, selecting merchandise for resale, controlling inventories, and determining profit. Basic mathematical formulas involved in merchandising are practiced.

224. *Flat Pattern Design.* I, II. 3 hr. PR: Tx.&Cl. 27, 124, 126 or consent. Opportunity for creative expression and for understanding of pattern design through flat pattern. Costumes designed and constructed by the student.

225. *Tailoring.* I, II. 3 hr. PR: Tx.&Cl. 27, 124, 224. Tailoring suits and coats. Emphasis on professional techniques, advanced fitting, and construction of garments.

226. *Apparel Design and Illustration.* II. 3 hr. PR: Tx.&Cl. 224 or consent. Art principles and fashion terminology explored to increase the ability to analyze apparel designs. Examination of different sources of design inspiration. Techniques of drawing from a live fashion model and various media for apparel design presentation.

227. *Advanced Textiles.* I, II. 3 hr. PR: Tx.&Cl. 27, 127. Comparative characteristics of all textile fibers are presented. Physical and chemical properties are explained with reference to fiber morphology and/or manufacturing processes.

228. *Clothing for Special Needs.* I. 3 hr. PR: Tx.&Cl. 224 or consent. Examines physical, psychological, and sociological clothing needs of handicapped and/or aged individuals. Historical developments, current research, and research needs are explored. Students conduct a pertinent individual research project.

Special Education

The Department of Special Education undergraduate program in the area of the mentally retarded is a teacher preparation program. Its major goals are to train students to become highly competent teachers of the mentally retarded and to provide multiple opportunities for the understanding of new and innovative methodological techniques. The program is offered as a subject specialization Grades K-12 in combination with the programs for Elementary School Teachers, Grades 1-6, or the program for Secondary School Teachers, Grades 7-12.

West Virginia urgently needs trained personnel in all phases of education of handicapped children and youth. State legislation mandates the counties to provide services for the handicapped school-aged population.

PROGRAM FOR TEACHING THE MENTALLY RETARDED*

(Secondary Students Only—Must be combined with a 7-12 Subject Specialization)

128 Hours Required for Graduation

General Academic Requirements	*Hr.*
Humanities	19
Engl. 1, 2—Composition and Rhetoric	6
Literature elective	3
L. Sci. 203—Literature for Children	3
Art 3—Materials and Procedures	3
Music 41—Music As an Art and Science	2
Music 42—Music Materials and Procedures	2
Social Studies	12
Hist. 1 or 2—Western Civilization	3
Three courses from the following: S. Sci. 1; Soc. & A. 1, 5, 102; Econ. 51, 55; Pol. S. 1, 2; Geog. 7, 8, 109; Psych. 1; Hist. 1, 2, 52, 53, 153; Ed. F. 1	9
Science and Mathematics	14
P. Sci. 1 or 2—Introductory General Course	4
Biol. 1 or 2—General Biology	4
Math. 33, 34—Introductory Mathematics for Teachers	6
Health and Physical Education	6
Hl. Ed. 101—School Health Program	2
P.E. 41—Movement Education and Rhythm	1
P.E. 42—Elementary Sports Skills	1
P.E. 43—Physical Education for Elementary Teachers	2
Teaching Specialization—Mentally Retarded	15
Sp. Ed. 250—Survey of Exceptional Children and Adults	3
Sp. Ed. 255—Introduction to Mental Retardation	3
Sp. Ed. 260—Curriculum and Methods for Special Education	3
Sp. Ed. 281—Developmental Language for the Mentally Retarded	3
SPA 250—Survey of Oral Communication Disorders	3
Subject Specialization	24-45
Professional Education Requirements	
General Education	14
C&I 7—Introduction to Education	2
Ed. P. 103—Human Development	3
Ed. P. 105—Learning	3
C&I 120—Elementary-Early Childhood Language Arts	3
Pre-student Teaching Block (Secondary)	9
C&I 104—Principles of Teaching in Secondary Schools	4
Rdng. 222—Reading in the Content Areas	2
Methods in Teaching Specializations	3
Pre-student Teaching Block (Elementary)	12
C&I 100—Elementary-Early Childhood General Methods	3
C&I 130—Elementary-Early Childhood Mathematics	2
C&I 140—Elementary-Early Childhood Science	2
C&I 150—Elementary-Early Childhood Social Studies	2
Rdng. 240—Corrective Language Arts Instruction	3
Student Teaching Semester	15
C&I 188—Student Teaching—Secondary	6
Sp. Ed. 280—Student Teaching—Special Education	6
C&I 280—Student Teaching Seminar	3

*Students desiring elementary education with an endorsement in mental retardation, please see programs for undergraduate elementary education.

Special Education (Sp. Ed.)

250. *Survey of Exceptional Children and Adults.* I, II, S. 3 hr. PR: Consent. Introduction to all areas of exceptionality. Definition, psychological and educational characteristics, and social and vocational adjustment.

255. *Introduction to Mental Retardation.* I, II, S. 3 hr. PR: Consent. Historical, etiological, social, educational, and vocational aspects of mental retardation.

260. *Curriculum and Methods for Special Education.* I, II, S. 3 hr. PR: Sp. Ed. 250, 255 and/or consent. Organization of instruction, adaptation of teaching methods in several curricula areas and construction of materials.

262. *Curriculum and Methods for the Trainable Mentally Retarded.* I, II, S. 3 hr. PR: Sp. Ed. 250, 255 and/or consent. Special problems of curriculum development for the trainable child and adult and development of original construction of curricula materials.

265. *Industrial Arts in Special Education.* II, S. 3 hr. Experimentation with industrial arts and crafts suitable for instruction in special education classes. Discussion of factors involved in selection and manipulation of such media as leather, plastics, ceramics, wood, and metal. *(Course will not be offered in 1983-84.)*

280. *Student Teaching Clinical Experience in Special Education.* I, II. 1-6 hr. PR: Consent. Student teaching with the mentally retarded.

281. *Special Problems and Workshop in Special Education.* I, II, S. 2-4 hr. PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topic.

Speech Pathology and Audiology

The Department of Speech Pathology and Audiology (SPA) is committed to the basic preparation of students interested in graduate work leading to a career in Speech Pathology and/or Audiology.

The emphasis of pre-professional undergraduate training in speech pathology and audiology is placed on broad education in basic speech and hearing sciences, anatomy and physiology of the speech and hearing mechanisms, normal development and behavior in the areas of speech, hearing, and language.

Graduates may prepare for careers by entering a graduate program at WVU or in other comparable programs for specialization in either speech pathology or audiology.

Upon completion of the master's degree the graduate will qualify for certification by the American Speech-Language-Hearing Association and by the West Virginia Board of Education.

General Requirements

Bachelor of Science in Speech Pathology and Audiology (B.S.)

1. Fulfill the University Core Curriculum requirements.
2. Present a total of 128 hours, including 58 upper-division hours, 8 hours of general biology, 3 hours of general psychology, and 15 hours in related areas.
3. Complete a minimum of 58 hours of SPA academic courses.
4. For continuation toward a degree, the student must maintain an overall grade-point average of 2.25, and an average in the major area of 2.5 or better, as well as exhibit the personal and professional qualities predictive of success in the profession.
5. Complete minimum requirements in clinical practicum.

SUGGESTED DISTRIBUTION OF COURSES FOR BACHELOR OF SCIENCE DEGREE IN SPEECH PATHOLOGY AND AUDIOLOGY

First Year

Courses to satisfy Core Curriculum
Biol. 1 and 2
Psych.1
SPA 80

Second Year

Continuation of Core Courses
SPA 50, 152, 153, 154

Third Year

SPA 156, 182, or 183, 222, 241, 242, 254 257
Electives in psychology, child development, linguistics

Fourth Year

SPA 220, 223, 251, 252, 253, 260, 282 or 283
Electives

Speech Pathology and Audiology (SPA)

50. *Introduction to Speech and Hearing.* I, II. 3 hr. Introduction to the profession of speech pathology and audiology, with emphasis on the role identification of health professionals. Normal speech production and language development. *(Course will not be offered in Spring Semester 1983-84.)*

80. *Speech Improvement: Theory and Performance.* I, II. 3 hr. Designed for improvement of the student's speech based upon theory and demonstrated performance of voice and diction skills and public-speaking skills for effective communication in a variety of speaking situations.

152. *Basic Speech and Hearing Science.* II. 3 hr. Application of the physical and social sciences to an understanding of the role of speech production and the acoustics of sound in human communication.

153. *Phonetics.* II. 3 hr. PR: SPA 50 or consent. Standard speech sounds of the English language. Use of phonetic symbols for recording speech sounds. Classification systems presented, with emphasis on distinctive feature analysis.

154. *Anatomy of the Speech and Hearing Mechanism.* II. 3 hr. Anatomical and physiological study of the vocal mechanisms and the ear.

156. *Articulation.* II. 3 hr. PR: SPA 50. Characteristics of normal articulation development and production. Nature and etiology of articulation disorders presented. Diagnostic procedures and general goals of therapy.

182. *Introductory Clinical Practice in Speech.* I, II, S. 1-3 hr. PR: Consent. Supervised assisting of speech diagnosis and therapy, including data keeping, preparation of clinical materials employed in therapy, observation of direct therapy, and written evaluations of observed sessions. *(Graded Pass-Fail only.)*

183. *Introductory Clinical Practice in Audiology.* I, II, S. 1-3 hr. PR: Consent. Supervised assisting of hearing diagnosis and therapy, including data keeping, preparation of clinical materials employed in diagnosis and therapy, observation of direct testing and therapy, and written evaluations of observed sessions. *(Graded Pass-Fail only.)*

210. *Manual Communication.* I, II. 3 hr. PR: Consent. Development of skills needed to communicate in sign language. The manual alphabet, basic number concepts, and the basic vocabulary of traditional American signs.

212. *Intermediate Manual Communication.* II. 3 hr. PR: SPA 210 or consent. Improve skills needed to communicate in sign language. Includes increasing sign language vocabulary, practicing fingerspelling, and communicating with signs.

220. *Audiological Assessment.* I, II. 4 hr. PR: Consent. Physics of acoustic signal production; introduction to basic audiometric techniques and interpretation.

222. *Hearing Conservation.* II. 2 hr. PR: SPA 220 or consent. Identification audiometry for infants and pre-school and school-age children; hearing conservation in industry.

223. *Aural Rehabilitation.* II. 3 hr. PR: SPA 220 or consent. Rehabilitative approaches to management in the auditorially handicapped individual. Medical, audiological, and social aspects of rehabilitation. Procedures of speech reading and auditory training will be examined and evaluated.

241. *Introduction: Speech Practicum.* I. 2 hr. PR: Consent. Routine clinical and administrative procedures in speech pathology, emphasizing observation, report writing, test administration and interpretation, equipment demonstration, clinical procedures, and language sampling.

242. *Introduction: Hearing Practicum.* I. 2 hr. PR: Consent. Routine clinical procedures in audiology are presented emphasizing observation, report writing, record keeping, equipment, and hearing testing.

250. *Speech-Language-Hearing: Development-Disorders.* I, II, S. 3 hr. (Non-majors.) PR: Consent. Discussion of normal processes and disorders of speech, language, and hearing in children and adults. Orientation course for students and teachers in early childhood, elementary, and secondary education, language arts specialists, psychologists, and rehabilitation specialists.

251. *Cleft Palate and Voice Disorders.* II. 3 hr. PR: SPA 50 or consent. Normal vocal production and embryological development of the face and palate. Nature and etiology of disorders of cleft palate and voice, diagnosis, and general goals of therapy.

252. *Stuttering.* I. 3 hr. PR: SPA 50. Development of normal fluency versus nonfluency examined in addition to the nature, etiology, theories, classification,and prognostic indicators of stuttering. General formal and informal assessment, treatment, and counseling procedures.

253. *Cerebral Palsy and Aphasia.* I. 3 hr. PR: SPA 50 or consent. Speech and language disorders related to cerebral injury, with emphasis on nature and etiology of cerebral palsy and aphasia. Diagnosis and general goals of therapy.

254. *Language Acquisition and Behavior.* I. 3 hr. Normal processes involved in the acquisition of language, including the development of phonological, semantic, and syntactical systems. Application of these processes to the diagnosis and treatment of language disorders.

257. *Public School Clinical Programs.* II. 3 hr. PR: SPA 50 or consent. Organization and structure of clinical programs in public school setting. Discussion of state and federal regulations, case selection, scheduling, program planning, and other administrative matters.

260. *Language Disorders in Children.* I. 3 hr. PR: SPA 254 or consent. Assessment and remediation procedures are examined. The utilization of current tests and analysis procedures in diagnosis are presented. Treatment approaches include commercially available programs and student-developed treatment strategies.

263. *Preschool Deaf Child.* I. 3 hr. PR: Consent. Importance of early detection and education, language development of congenitally deaf child, and parents' role in early childhood education.

265. *Parent Programs: Communicatively Disordered Children.* II. 2 hr. Students will learn to organize and implement parent involvement programs in a variety of settings, interview parents, conduct conferences, utilize appropriate materials, and interact effectively with parents of communicatively handicapped children through lectures and practica.

281. *Special Topics.* I, II, S. 1-6 hr. per sem.; (Max. credit, 6 hr.). PR: Consent. Independent study in speech pathology, audiology, and speech and hearing sciences.

282. *Clinical Practice in Speech.* I, II, S. 1-6 hr. PR: Consent. *(May be taken for a maximum of 3 hours per semester for undergraduate or graduate credit.)* Supervised diagnosis and therapy of speech disorders.

283. *Clinical Practice in Audiology.* I, II, S. 1-6 hr. PR: Consent. *(May be taken for a maximum of 3 hours per semester for undergraduate or graduate credit.)* Supervised diagnosis and therapy of hearing disorders.

Technology Education

The technology education program is a graduate program only. However, certain courses offered by the program faculty at the 200 and 300 levels are available as electives for qualified junior and senior students. (T.E. 280, Women in International Development, and T.E. 281, Introduction to Technology, qualify as Core B courses. See page 336, *Graduate Catalog.*)

The primary focus of the program is the study of technology, the relationship of technical systems to the civilization process, and the implications of changes in these systems on the quality of life and the education of citizens. Faculty and students in the program are commited to a continuing investigation of the impact of communication systems, transportation systems, and production systems on people, society and the environment. The goal of the program is an increased level of understanding about technical means so as to provide the basis for developing, controlling, directing and redirecting technical systems for the benefit of humankind.

Perley Isaac Reed School of Journalism

The Perley Isaac Reed School of Journalism, one of the oldest in the United States (established in 1939), offers appropriate education to students who will become interpreters of our modern complex issues.

Many of the more than 1,900 graduates of the School of Journalism are using their broad education and training by covering news events throughout the world for Associated Press, United Press International, and other news media; by managing major accounts in such advertising agencies as J. Walter Thompson and Carl Byoir and Associates in New York City; and by serving in public relations positions with corporations and other institutions. They are newspaper reporters, broadcasters, university professors, business men and women, army officers, school principals, and homemakers.

The study of journalism—once limited to vocational training of newspaper reporters—now includes the many ways in which a person uses communication, with emphasis on ethics and responsibility in the broad study of mass communication and society. Such an education must be interdisciplinary, based upon the liberal arts and social sciences.

A journalism education involves more than learning how to write and edit news stories, to broadcast documentaries, or to develop creative advertisements and public relations campaigns. It involves study of the substantive issues that need to be communicated, as well as those that have already occurred.

Once students grasp the fundamentals of the liberal arts, they must seek more than the ability to communicate. They must also acquire ethical awareness because future journalistic work will have impact far beyond that of most occupations. A successful public relations practitioner or advertising executive must know where ethical advocacy of a product ends and hucksterism begins. The photographer-journalist and the editor must know where the presentation of fact ends and fabrication begins. It is in this realm, as well as that of substantive course work, that a faculty of high quality plays a major role.

When students enroll in the School of Journalism, they are guided by a faculty of fourteen full-time and four part-time professors who represent more than 140 years of cumulative journalistic experience. It is a faculty that represents the diversity of the school itself. The backgrounds and education of the teaching staff include professional experience with newspapers, the wire services, radio and television, public relations firms, and advertising agencies.

The School of Journalism works with students in writing courses to get their work published. Their articles frequently appear in the *Daily Athenaeum*, student newspaper at WVU; in the *Morgantown Dominion-Post;* in *Take One*, the news-editorial laboratory newspaper; in *Martin Monitor*, a public relations publication; and in state and national publications. Students have been named to Sears Congressional Fellowships in the nation's capital for one semester, to Magazine Publishers Association summer fellowships, and to legislative internships in the state capital. In addition, the School of Journalism maintains a working relationship with the *Daily Athenaeum*. Students serve as reporters and editors for the paper as an extracurricular activity. The School of Journalism also operates a newsroom to give students practical writing and editing experience, and one of the products is *Take One*.

Advanced students in photojournalism may receive practical experience as photographers for the *Daily Athenaeum*, as local stringers for Associated Press, and as part-time photographers for the WVU Office of Publications.

Advertising students find opportunities for practical experience by selling advertisements and servicing accounts for the *Daily Athenaeum* and other campus publications as well as by handling the paper's other business matters.

Students directing their studies toward production have an opportunity to become involved in both letterpress and offset projects in newspaper production laboratories. Those wishing to get involved in newspaper production have ample opportunity to become members of the *Daily Athenaeum* production staff; and they learn how to run the latest cold-type production equipment as well as how to paste up newspapers.

Public relations students generate and execute projects aimed at identifying and solving communications bottlenecks between local and statewide organizations and the public. They also serve internships during the summer and throughout the school year. Public relations and news-editorial majors participate in intern programs in the WVU Sports Information Office, and public relations and advertising majors gain valuable experience in case study competitions.

Because students write, edit, sell advertising, and even do the typesetting and page paste-up for the *Daily Athenaeum*, they may experience any facet of journalistic life they wish to pursue.

Students in the broadcast journalism sequence gain basic knowledge and entry-level skills in radio-television news in the introductory courses. They gather, write, edit and present the news, and use such learning aids as audio

and video tape (both portable and studio), and film. They may build on that foundation both in the more advanced courses and through internships and similar work-and-study opportunities at the University's television station (WWVU-TV), Office of Publications, Sports Information Office, the WVU Cooperative Extension Service, and with commercial television and radio stations.

The School of Journalism also operates a summer program that places superior students in jobs with newspapers, magazines, radio stations, television stations, businesses, and industries for about ten weeks.

The School of Journalism is in recently renovated Martin Hall, WVU's oldest building (constructed in 1870). More than $1.8 million was spent on renovating, furnishing, and equipping the building. While the interior was completely modernized, the appearance of the exterior was maintained; the new annex on the west end of the building was constructed so that it would blend with the old.

The laboratories include electric typewriters, a video display terminal system, modern radio and television equipment, light tables, a photocomposition unit with more than 100 typefaces, photoenlargers, cameras, and equipment for independent study. In addition, there is a reading room with current newspapers, magazines, professional journals, and reference works.

Faculty

Guy H. Stewart, Ph.D (U. Ill.), *Dean and Professor of Journalism.*
Paul A. Atkins, M.A. (U. Va.), *Professor of Journalism.*
Donovan H. Bond, M.A. (WVU), *Professor of Journalism.*
Paul I. Coble, A.B. (Wittenberg U.), *Assistant Professor of Journalism.*
Charles F. Cremer, Ph.D. (U. Iowa), *Professor of Journalism.*
Harry W. Elwood, M.S. (Northwestern U.), *Associate Professor of Journalism.*
Harry W. Ernst, M.S.J. (Northwestern U.), *Assistant Professor of Journalism.*
Patricia C. Findley, M.A. (Calif. St. U.), *Assistant Professor of Journalism.*
Dennis R. Godfrey, M.A. (WVU), *Adjunct Assistant Professor of Journalism.*
Frank M. Kearns, B.A. (WVU), *Claude Worthington Benedum Professor of Journalism.*
Hunter P. McCartney, Ph.D. (U. Penn), *Professor of Journalism.*
Robert M. Ours, Ph.D. (C. Wm. & Mary), *Associate Professor of Journalism.*
Stephen E. Rada, Ph.D. (U. Tex.), *Associate Professor of Journalism.*
P. Michael Ryan, Ph.D. (S. Ill. U.), *Professor of Journalism.*
William O. Seymour, M.A. (E. Tex. St. U.), *Associate Professor of Journalism.*
William R. Summers, Jr., M.A. (U. Mo.), *Professor of Journalism..*
C. Gregory Van Camp, M.S.J. (WVU), *Associate Professor of Journalism.*
Pamela D. Yagle, M.S.J. (WVU), *Assistant Professor of Journalism.*

Standing Committees

Academic Standards: H. P. McCartney *(Chairperson)*, C. F. Cremer, W. O. Seymour, and student representative.

Committee of the Eighties: D. H. Bond *(Chairperson)*, C. F. Cremer, H. P. McCartney, P. M. Ryan, P. A. Atkins (ex officio), and W. R. Summers, Jr. (ex officio).

Executive: Dean G. H. Stewart *(Chairperson)*, P. A. Atkins, C. F. Cremer, H. P. McCartney, and W. R. Summers, Jr.

Graduate Studies: P. M. Ryan *(Chairperson)*, D. H. Bond, C. F. Cremer, R. M. Ours, S. E. Rada, and student representatives.

Journalism Proficiency Examination: P. C. Findley *(Chairperson)*, R. M. Ours, and P. D. Yagle.

Off-Campus Education: P. D. Yagle *(Chairperson)*, H. W. Elwood, W. O. Seymour, W. R. Summers, Jr., and student representatives.

Placement: D. H. Bond *(Chairperson)*, P. I. Coble, and student representatives.

Research: P. M. Ryan *(Chairperson)*, D. H. Bond, and F. M. Kearns.

Scholarships: S. E. Rada *(Chairperson)*, H. W. Elwood, and student representatives.

Teacher Evaluation: F. M. Kearns *(Chairperson)*, W. R. Summers, Jr., and P. D. Yagle.

Professional Advisory Committees

Visiting: R. M. Rine *(Chairperson)*, G. Andrick, C. K. Connor, Jr., L. P. Harvath, III, R. G. Owens, J. Purser, J. C. Shott, J. Swearingen, and F. Young.

Public Relations Advisory Council: H. W. Chaddock, J. Purser, and W. H. Oliver.

Accreditation

The School of Journalism is fully accredited by the American Council on Education for Journalism and Mass Communication (ACEJMC) for the unit (school) and five sequences—advertising, broadcast journalism, graduate professional, news-editorial, and public relations. ACEJMC approval is held by approximately 85 colleges and universities in the United States.

The quality of the school's programs has also been recognized by memberships in the Association of Schools of Journalism and Mass Communication and the American Society of Journalism School Administrators.

Professional Relations

A close and continuing relationship is maintained with the West Virginia mass media through the West Virginia Press Association, the West Virginia Press Women, the West Virginia Broadcasters Association, Public Relations Society of America (West Virginia and Pittsburgh Chapters), and adjunct to the Press Association—the West Virginia Public Relations Associates. These groups have provided educational and financial support to the school.

In turn, the School of Journalism provides services to the professionals. Regional advertising seminars have been conducted for newspaper publishers and retail merchants, and workshops on newswriting have been conducted for stringer-correspondents of weekly newpapers. The school has provided science writing symposia and seminars on Appalachia, future of transportation, and interpretive vs. advocacy reporting for news people; it also has worked with the Public Relations Associates of the Press Association in establishing seminars. The school has assisted journalism teachers by sponsoring summer workshops and by working with their publications staffs during the school year.

In addition, the school has provided advertising counsel for the West Virginia Center for Development of Minority Business.

Typewriting

Before or soon after entering WVU, a student planning to major in journalism should learn the touch system of typing. From the beginning, all students in writing courses are expected to submit copy in neat, typewritten form.

Admission

To be admitted to the School of Journalism as a journalism major, a student must meet these requirements:

1. Must have successfully completed 58 hours (excluding F's) with an overall grade-point average of 2.0, with at least a 2.0 average in journalism courses; or, must have a 2.5 overall grade-point average if the student has already attempted 75 or more hours.

2. Must file for admission with the School of Journalism or the head of the sequence in which one wishes to study; application must be approved by the dean.

3. Must complete Journalism 15 and Journalism 18, or equivalents, with at least a C grade in each course.

4. Must pass the School's Journalism Proficiency Examination.

5. Must achieve at least a 2.0 in English 1 and 2. (See "Proficiency in English," below.)

6. Must complete Library Science 1 with a passing grade.

7. Must agree to complete at least 45 hours in the School of Journalism.

Complete information concerning WVU admission, registration, fees and expenses, and regulations may be obtained in Part 2 of the *Undergraduate Catalog*.

Proficiency in English

Competence in writing is emphasized. A student who plans to major in journalism must achieve at least a 2.0 average or higher in English 1 and 2. In addition, students must pass the Journalism Proficiency Examination (JPE) administered in Journalism 15. If a student does not pass the JPE on the first attempt, he/she will be provided two more opportunities. A student who plans to major in journalism may not enroll in additional journalism courses before passing the JPE.

Journalism Organizations

Several organizations affiliated with the School of Journalism provide the opportunity for honor and recognition as well as for fellowship and education. They are:

Alpha Delta Sigma, scholastic advertising honorary.

American Advertising Federation, professional advertising fraternity.

Kappa Tau Alpha, national scholastic honorary for students with exceptional academic records in journalism.

Public Relations Student Society of America, national public relations professional organization.

The Society of Professional Journalists, Sigma Delta Chi, professional society for news and broadcasting majors.

Job Placement

The School of Journalism assists its graduates in finding desirable positions. It acts as a placement clearinghouse for current and past graduates, and it advises and assists students in the preparation of resumes.

Representatives of newspapers, magazines, public relations, broadcasting, and advertising frequently request the School of Journalism to provide applicants for their openings.

Bachelor of Science in Journalism (B.S.J.)

A candidate who has satisfied all general requirements of the University and has met the requirements of the School of Journalism will be recommended for the degree of Bachelor of Science in Journalism (B.S.J.), provided the combined numbers of credits acquired as a pre-journalism student and as a regularly enrolled journalism major totals no fewer than 128. *This total will not count non-translated courses from other colleges, any course repeated more than one time (such as Music 102), unless it represents a*

new and different learning experience, or Mathematics 2. While WVU frequently accepts all junior college credits, the School of Journalism follows the American Council on Education for Journalism and Mass Communication recommendation of accepting no more than 12 journalism credits from such institutions. While a student may take a number of multidisciplinary courses as electives, only one such 3-hour course will be allowed toward Core C.

In line with the national accreditation council and the school's philosophy on the ratio of professional journalism courses to courses in liberal arts, a degree candidate will take approximately one-fourth of the total hours in journalism. The minimum number of journalism hours will be 30, and the maximum number ordinarily will be 33. No fewer than 40 hours shall be obtained in courses numbered between 100 and 400. A student must complete at least 45 hours after admission to the School of Journalism.

A student may pursue another degree concurrently, but the candidate must plan the program with the deans of the two colleges or schools involved. To receive the second baccalaureate degree, the student must complete 158 credit hours. A student with one bachelor's degree also may seek a bachelor's degree in journalism. The student must plan the program with the dean.

A student within 12 hours of graduation in the last semester may elect to take one or more courses for graduate credit. However, the student must consult with his/her adviser.

The student, in the penultimate semester, will be expected to provide for School of Journalism records a small head-and-shoulders photograph and information about the student's future employment preferences.

Scholastic Requirements

To be eligible for graduation, a student must earn a minimum cumulative grade-point average of 2.0; concurrently, the journalism average and the average in the student's minor field must be at least 2.0. Courses totaling 15 hours in the minor field or 12 hours in each of two minors are counted toward the minimum 2.0 grade-point average.

No student will be recommended for the degree unless it has been shown to the satisfaction of the faculty that the student possesses abilities and qualifications that give promise of doing adequate work in professional journalism.

Independent Study/Waivers

The journalism faculty encourages students to take courses by examination and through independent study, when the student's background and the nature of the courses lend themselves to such arrangements. The method of examination can be appropriate when students have in some way other than by class attendance learned the course content. Independent study may be undertaken in some courses with the consent and supervision of the professor. In unusual cases, a student may receive the Dean's permission to waive a course.

Probation/Full-Time Load

A student on probation shall not take more than 15 hours of course work in a semester, and the Committee on Academic Standards may require that the student not take more than 12 hours. No student may enroll for more than 18 hours in a single semester without petitioning the student's adviser.

Withdrawal From Class Or University

All students enrolled in journalism courses may withdraw from a course until the Friday of the tenth week of classes (see the University Calendar for the date) with a grade of W. After that date, a student may withdraw only after approval of the Committee on Academic Standards, and then the student will be awarded a grade of W or WU.

Journalism majors who withdraw from the University after the tenth week of a semester will be automatically suspended from the School of Journalism for a minimum of one semester (not including a summer session). If a late withdrawal results from illness, the student must present a written excuse from a physician at the time of withdrawal to avoid automatic suspension.

Minor Field

To meet the requirements of a minor, a student must earn at least 15 hours in a subject other than journalism with no more than 3 hours in courses numbered under 100. Courses at the 100-level or higher, even when they can be taken more than once, will be counted only one time. For students pursuing two minors simultaneously, the requirements in each area are at least 12 hours, of which no more than 3 hours can be numbered under 100. A student should consult the adviser about a minor.

Students from other major fields of study are permitted to minor in journalism.

Minor/Special Emphasis

Because many journalism majors need to know more and more about economics and business, a number of special business minors have been developed cooperatively with the College of Business and Economics. Students interested in such a minor should confer with their advisers. The faculty also has approved an international studies minor. Students interested in this minor should consult with their advisers.

Internship Credit

A number of internship opportunities for credit are available in the summer; to a lesser extent such credit is available during the academic year. All students interested in internship credit must apply for it and register *in advance* and establish a "contract" with the head of a sequence. This "contract" is essentially an agreement that spells out the terms under which credit will be given. It describes the kind of learning experience that will be involved, including assignments, reports, type of supervision, and the evaluation by a supervisor on the job plus a member of the school's faculty. Not more than 10 percent of a student's journalism credits can be earned via internships in accordance with ACEJMC standards.

Advertising Curriculum

The advertising curriculum is designed to prepare students for careers in the creation, sales, management, and production of advertising.

Journ. 50, 113, 114, 203, and 239 are the basic advertising courses in the sequence. Everything else in advertising is founded on these courses.

Students develop a specialization in advertising in the junior and senior years. The specialization areas are: Copy (Journ. 114, 215, 216); Media (Journ. 203, 204, 251); and Graphics (Journ. 110, 210).

The minor field is subject to approval of the adviser. Some approved minors are marketing (highly recommended), economics, management, finance, business law, psychology, art, and speech communication.

Persons who are interested in practical application of advertising production problems should consider part-time employment in the offset production plant of the *Daily Athenaeum*, in addition to electing Journ. 210.

Students in advertising prepare for careers with advertising agencies, company advertising departments, retail advertising, promotion, and the media.

First Year

Journalism 1	3
Journalism 15	2
Journalism 18	3
English 1	3
English 2	3
Core C	8
Humanities 1/2/3/4/5/10/11/191	6
Political Science 2	3
Elective	3
Library Science 1	1

Second Year

Journalism 50	3
Journalism 113	3
English elective	3
Economics 51/100-level courses*	6
History 52/53	6
Core C	4
Electives (recommend Psychology and Marketing)	6

Third Year

Journalism 114	2
Journalism electives**	5-6
Minor field	6
Electives	3
English elective	3
Statistics/Mathematics	9-10

Fourth Year

Journalism 203	3
Journalism 239	2
Journalism 299	2
Journalism electives**	5-6
Minor field	6
Electives (Theatre, Art, Music, Speech Communication, Sociology/Anthropology	12-14

*Marketing minors must take Econ. 54/55.

**Advertising majors select one specialty area.

Broadcast News Curriculum

The broadcast news curriculum is supported by a complete teleproduction facility including television and radio studios and associated control room, video and audio tape assembly and editing area, and a film editing facility. However, the focus and the thrust of the instruction in the broadcast journalism curriculum stresses basic news writing, editorial judgment, and the principles as well as the practices of radio and television news.

Supported by a broad liberal arts background, the curriculum stresses an integration of news equipment familiarization, journalism principles and practices, legal aspects, journalism ethics, and professional standards and norms. Such a preparation helps students not only to develop their own communicative skills but also to develop an appreciation of radio, television, cable, and newsfilm as communicative and journalistic arts. Additionally, these studies challenge the student's ability to evaluate and criticize broadcast media functions, performance, responsibilties, and influence in society.

Professional staff members of WVU's Office of Radio, Television, and Motion Pictures, Radio-TV Extension Service, and Radio-TV News Service hold joint appointments and teach in some broadcast journalism courses. The Office of Radio, TV and Motion Pictures operates the University-owned educational television station, WWVU-TV.

Students seeking a career in the news and information area in broadcasting should pursue this curriculum. The student's minor field must be approved by the adviser.

First Year

Journalism 1	3
Journalism 15	2
Journalism 117	3
English 1	3
English 2	3
Elective	3
Core C	8
Humanities 1/2/3/4/5/10/11/191	6
Political Science 2	3
Library Science 1	1

Second Year

Journalism 18	3
English electives	6
History 52/53	6
Political Science 120	3
Core C	4
Electives	4
Economics 51/100-level courses	6

Third Year

Journalism 182	3
Journalism 183	3
Journalism electives	3
Minor field	9
Electives	14

Fourth Year

Journalism 284	3
Journalism 299	2
Journalism electives	6
Electives	14
Minor field	6

Journalism electives must be taken from the following list unless substitutions are approved by the adviser: Journ. 19, 111, 113, 120, 128, 189, 216, 227, 228, 285.

Journalism Education Curriculum

The School of Journalism has been working for a number of years with journalism teachers and administrators in West Virginia schools to improve journalism instruction and school publications. An even greater effort has been made over the past decade through regional high school workshops, critiques of school papers, the West Virginia High School Journalism Competition, and individual consultation with schools by members of the School of Journalism faculty.

One of the outgrowths of this cooperative effort has been a certification program in Journalism. The student who finishes the curriculum outlined here and receives the degree of Bachelor of Science in Journalism will qualify for a first-class professional certificate in West Virginia with teaching fields in Journalism and English (or other fields of student's choice), Grades 7-12.

While English is selected as the second field by most journalism majors, one may name social studies, speech communication, art, or another field. However, one must also consult the General Studies section of the certification program for other requirements.

If a student elects journalism as a second field, the student must take Journalism 1, 18, 19, 113, 120, 225, 227, and 299 for a total of 24 hours plus 6-9 hours of Journalism electives. Students in teacher certification fields do not have minors.

A student must attain an overall grade-point average of 2.25 before being admitted to student teaching, and the grade-point average must be at least 2.0 in any field chosen outside of the teaching block in the semester during which the student plans to do student teaching; the student may need to teach in a community away from Morgantown.

First Year	
Journalism 1	3
Journalism 15	2
English 1	3
English 2	3
Biology 1 and 2*	8
Humanities 1/2/3/4/5/10/11/191	3
Mathematics	3
General Physical Education 1/2	2
History 52/53	6
Curriculum and Instruction 7	2
Library Science 1	1

Second Year	
Journalism 18	3
Journalism 19	3
Linguistics 1	3
Social Science, Mutlidisciplinary Studies, Sociology and Anthropology	3
English 21**	3
English 22	3
English 24	3
English 25	3
Art 30/Music 30/Theatre 30	3
Educational Psychology 103	3
Educational Psychology 105	3

*A student may elect another science in sequence, e.g., Physical Science 1 and 2.

**A student may select a second teaching field in place of English and, therefore, may require different courses to satisfy that field.

Third Year	
Journalism 113	3
Journalism 225	3
Journalism electives	3-6
Soc. Sci., MDS, Soc. & A., or Ed.F. 1	3
Curriculum & Instruction 104	4
Curriculum & Instruction 124	3
Reading 222	2
English 108	3
English 111	3
English 125	3
English electives	6
Health Education 102	2

Fourth Year	
Journalism 120	3
Journalism 227	3
Journalism 299	2
Journalism electives	3-6
Curriculum & Instruction 188	12
Curriculum & Instruction 224	2
Curriculum & Instruction 225	2
Curriculum & Instruction 280	3
English 80, 188, 241, 280, 286, 288	3
English 293	1
English 294	3
English 295	3

Journalism electives must be taken from the following list unless substitutions are approved by the adviser. Journalism electives: Journ. 50, 110, 111, 118, 141, 182, 183, 220, 228, 230.

News/Editorial Curriculum

This curriculum is devoted to teaching fact-gathering, news and feature writing, and the various skills of editing. The sequence stemmed from the first courses offered in journalism at WVU.

Most news-editorial graduates have found employment with newspapers, magazines, and other publications or with the international press associations. This, in part, is because they have received excellent preparation for such careers in print media by working on the staff of the *Daily Athenaeum* and other newspapers. Other graduates, however, have gone into broadcasting or public relations or hold writing and editing positions in the professions, scientific fields, business, industry, and government.

News-editorial students most frequently minor in political science, history, or English. But it is becoming more common for them to select such areas as sociology and anthropology, psychology, speech communication, and economics.

First Year

Journalism 1	3
Journalism 15	2
Journalism 18	3
English 1	3
English 2	3
Humanities 1/2/3/4/5/10/11/191	6
Core C	8
Elective	3
Political Science 2	3
Library Science 1	1

Second Year

Journalism 19	3
Journalism 120	3
History 52/53	6
Economics 51/100-level courses	6
English elective	3
Science/Core C	4
Political Science 120	3
Electives	3-6

Third Year

Journalism 118	3
Journalism 128/220/227/230*	6
Minor (upper division)	6
Electives	15
English elective	3

Fourth Year

Journalism 228	3
Journalism 299	2
Minor (upper division)	6
Electives	10-13
Journalism electives	2-7

Journalism electives must be taken from the following list unless substitutions are approved by the adviser: Journ. 108, 110, 111, 113, 117, 130, 141, 182, 183.

*Since two of these courses are needed, one may be taken the fourth year.

Public Relations Curriculum

Public relations offers practitioners challenging opportunities to explain organizations—industrial, educational, military, charitable—to their publics. WVU graduates are finding ready acceptance of their services.

The curriculum is organized to provide the student a comprehensive familiarity with all aspects of communications—written, spoken, and image—and with important concepts in the social sciences. The student learns to gather, interpret, and present information in the varied media of communications—newspapers, radio, TV, and specialized forms (brochures, reports, slides, speeches, etc.). Besides studying public relations the student learns principles of advertising, photography, typography and layout, programming, and organizational and management functions.

A public relations major is encouraged to select a minor that will provide a deeper understanding of personal and interpersonal relationships—e.g., political science, psychology, sociology and anthropology—or a minor that will enhance the projected area of practice, e.g., business and economics, education, or science.

First Year

Journalism 1	3
Journalism 15	2
English 1	3
English 2	3
Psychology 1	3
Humanities 1/2/3/4/5/10/11/191	3
Science*	8
Library Science 1	1
Political Science 2	3
Foreign Language	3
Mathematics 3	3

Second Year

Journalism 18	3
Journalism 19	3
Economics 54/55	6
English**	6
History 52/53	6
Philosophy 1 or 10	3
Speech Communication 11/14	3
Foreign Language	3
Accounting 51	3

*Two science courses must be taken in sequence, e.g., Biol. 1 and 2 or Geol. 1/2 and 3/4.

**Two literature courses must be taken in sequence, e.g., Engl. 21 and 22 or Engl. 24 and 25.

Third Year	
Journalism 111	3
Journalism 121	3
Journalism 124	3
Psychology 101/151	3
Statistics 101	3
Marketing 111	3
Minor electives	6
Computer Science 1/5	4
Journalism electives	3-6
Elective	3

Fourth Year	
Journalism 221/222	3
Journalism 299	2
Political Science 120	3
Management 105	3
Minor electives	6
Electives	6-7
Journalism electives	4-7

Journalism electives must be taken from the following list unless substitutions are approved by the adviser: Journ. 110, 113, 117, 118, 120, 220, 228.

Courses of Instruction in Journalism (Journ.)

1. *Introduction to Mass Communications.* I, II. 3 hr. *(Recommended for all University students.)* Mass communicator's role in developing political, social, and economic fabrics of a democratic society. Organization and function of newspapers, magazines, broadcast stations, and other principal media, including the role of advertising and public relations.

15. *Basic Journalistic Writing.* I, II, S. 2 hr. PR: Journ. 1 or consent. Learn basic styles of journalistic writing in advertising, broadcasting, newswriting and public relations with strong emphasis on English grammar, punctuation and spelling. Passing the Journalism Proficiency Examination is a course requirement.

18. *News Writing.* I, II. 3 hr. PR: Journ. 15 or consent. Essentials of fact-gathering; writing news and features; ethics and responsibilities of news reporting. Typing ability required. Also, an honors section and laboratories are available to students who have good writing ability. A permit is required for the honors section. Two lec. and a 2-hr. laboratory-demonstration period.

19. *Copy Editing and Make-Up.* I, II. 3 hr. PR: Journ. 18. Combination lecture laboratory twice a week for two hours, plus laboratory experience on the School's laboratory paper, *Take One.* Copy editing, headline writing, handling of wire copy, and make-up. Public relations sections emphasize make-up of internal publications.

50. *Visual Communication.* I, II. 3 hr. PR: Journ. 18. Graphic arts as a communication medium. Discussion of photography and typography with emphasis on basic techniques and aesthetics.

108. *The Community Newspaper.* I. 2 hr. *(Open to all University students.)* Fundamental problems and techniques in operation of community newspapers.

110. *Typography and Printing Processes.* I. 3 hr. Fundamentals of print production, including design and composition procedures for major printing processes; discussion and application of typographic aesthetics. *(Students must acquire tools for the course: cost about $5.00.)* One lec., 2 hr. lab.

111. *Introduction to Public Relations.* I, II. 3 hr. *(Open to all University students; required in the public relations curriculum.)* Introduces the student to the principles of public relations. Definition and historical development, opportunities and challenges, techniques and management of public relations are included.

113. *Principles of Advertising.* I, II, S. 3 hr. *(Open to all but freshmen.)* Advertising in the American economic system for national and retail advertisers. Study of individual advertising and media, copy and layout problems, appeals, research production, schedules, federal and state laws affecting advertising, and ethics. Practical laboratory work in writing and layout of advertising. Two lec., one 2-hr. lab.

114. *Retail Advertising.* I, II. 2 hr. PR: Journ. 50 and 113, or consent. Planning, preparation of newspaper advertising campaign for a daily newspaper, including supplementary assignments in radio copy, direct mail, outdoor advertising, and sales promotion. 2 hr. lec.

117. *Introduction to Broadcasting.* I, II, S. 3 hr. Survey of the broadcasting industry from the perspective of broadcast journalism, including historical development, federal regulation, industry codes, professional responsibilities, broadcasting research, and contemporary developments including cablevision.

118. *Advanced Reporting and Editing.* I, II. 3 hr. PR: Journ. 18 and 19. Development of a student's ability to cover and write spot news, public affairs and interpretative articles, and investigative stories. Laboratory work includes doing assignment sheets, editing stories and editing and makeup for the School's laboratory newspaper, *Take One.*

120. *Introduction to Photography.* I, II, S. 3 hr. Basic techniques of film developing and printing. Students are required to purchase their own film, enlarging paper, chemicals, and have access to a camera. *(The supplies cost approximately $45.00-55.00 per semester.)*

121. *Public Relations Research and Theory.* I, II. 3 hr. PR: Stat. 101, Journ. 18, 111. Explores various theories of public opinion formation; applies methods of measuring and analyzing public opinion for application to public relations programs for changing, maintaining, or crystallizing public opinion for socially acceptable causes.

124. *Public Relations Applications.* I, II. 3 hr. PR: Journ. 121. Applied principles of public relations enabling institutions to explain their activities and gain public support. (Weekly laboratory sessions in which students develop tools and techniques for these applications.)

128. *Reporting of Public Affairs.* II. 3 hr. PR: Journ. 18 or consent. Reporting local, state, and federal government activities and other public affairs. Visits to public agencies and training in spot news and depth reporting in public affairs.

130. *Advanced Photography.* I. 3 hr. PR: Journ. 120 or equiv., or consent. Designed to equip students to serve all communication media including magazines, newspapers, and television. A high level of competence is assumed at the outset. Course requirements include a portfolio (general or around a specific theme) and numerous weekly assignments.

141. *Advanced Journalism Problems.* I, II, S. 1-6 hr. For juniors and seniors. Intensive, independent study; to be approved by the Dean.

182. *Broadcast Journalism 1.* I, II. 3 hr. PR: Journ. 18, admission to the School, and consent. Lecture-laboratory course oriented to radio news. Gathering, writing, editing, and presenting news for radio. Outside taping and studio taping, broadcasts; monitoring local and network newscasts. Emphasis on writing news scripts and producing newscasts.

183. *Broadcast Journalism 2.* I, II. 3 hr. PR: Journ. 182 and consent. Continuation of Journ. 182, with course content oriented to television news, including electronic news gathering (ENG).

189. *Newsfilm in Television.* I, II. 3 hr. PR: Consent. Planning, shooting, editing, and scripting of newsfilm for television newscasts. *(Film and processing cost about $50.00 per student.)*

203. *Advertising Media Analysis.* I. 3 hr. PR: Journ. 113 and senior standing, or consent. Buying, estimating, and scheduling of print and broadcast media. Preparation of media rationale for national campaigns based on research and statistical analysis and computerized data. Determination of advertising allocations; sales representation; promotion.

204. *Media Management.* II. 3 hr. PR: Journ. 113, 114, and 203 or consent. Planning of advertising appropriations in national and international print and broadcast media. Client, agency, and media responsibilities. Evaluation of advertising. Presentation.

210. *Graphic Design.* II. 3 hr. PR: Journ. 110 or consent. Design layouts for print media. Includes buying, supervising, and scheduling of art, typography, and print material. 2 hr. lec., 2 hr. lab.

215. *Advanced Print Copywriting.* II. 2 hr. PR: Journ. 50, 113, 114 or consent. Copy concepts, copy platforms, techniques, and strategies. Preparation of copy and media for a national campaign. 2 hr. lec., 2 hr. lab.

216. *Broadcast Copywriting and Studio Production.* I. 2 hr. PR: Journ. 50, 113, and 215 or consent. Writing and production of radio and television commercials. Includes preparation of scripts, storyboards, selection of talent, and studio direction. 2 hr. lec., 2 hr. lab.

220. *Writing for Magazines.* I, II, S. 3 hr. PR: Upper-division or graduate standing; Journ. 18 or equivalent preparation in grammar, punctuation, and spelling. Professional approach; magazine analysis, query letters, writing, rewriting; submitting manuscripts for publication.

221. *Public Relations Interning.* I, S. 3 hr. PR: Journ. 124. *(Open only to junior, senior, and graduate public relations majors.)* Student learns through on-the-job training. Course structured along a public relations agency organization and operations.

222. *Public Relations Case Studies.* II. 3 hr. PR: Journ. 124. Seminar based on in-depth studies of public relations programs developed and applied in support of our institutions. Primary emphasis on successful campaigns, but unsuccessful efforts also will be examined for causes of failure.

225. *High School Publications Advising.* II. (Alternate Years.) 3 hr. PR: Journ. 18, 19, 113. *(For students seeking Journalism certification.)* Emphasizes writing styles, newspaper/yearbook layout, rights and responsibilities of the teacher, students, and school system. Enrollees will construct instructional portfolios based on research and classroom discussion concepts. *(Course will not be offered in 1984-85.)*

227. *History of Journalism.* I. 3 hr. PR: Hist. 52 and 53 or consent. *(Open to all University students.)* Impact of the American press on the nation; development of today's media from the beginnings in seventeenth-century England and in the American colonies; great names in journalism; freedom of the press and its current implications.

228. *Law of the News Media.* II. 3 hr. *(For seniors and graduate students.)* The law as it affects the mass media. Considered are such areas as libel, privacy, public records, criminal pre-trial publicity, freedom of information, obscenity.

230. *Editorial and Critical Writing.* I. 3 hr. *(Open to all University students.)* The student will analyze and write commentaries; study typical editorial pages and the ethics governing editorial page content; become familiar with libel, privacy, contempt, and other problems—operating and political—as they arise.

231. *Color Photography.* I. 3 hr. PR: Journ. 120 and 130 or consent. The theory of color slides and prints, including slide development, as applied to multi-media presentations. *(Supplies will cost $50.00-70.00.)*

239. *Seminar in Advertising Management Problems.* I, II. 2 hr. PR: Senior standing and major or minor in advertising. Application of the study of advertising research, law, and theory in the preparation of a national advertising campaign. Aspects of the campaign to cover marketing, research, creative, media, sales promotion, and presentation.

251. *Direct Mail Advertising.* II. 3 hr. PR: Journ. 113 and 114 or consent. Mailing, marketing, and creation of direct-mail letters, brochures, involvement pieces, and reply cards. Postal regulations, direct-mail law, and printing procedures. 2 lec., 1 lab.

284. *Electronic Newsgathering for Television.* I, II. 3 hr. PR: Journ. 183 and consent. Preparation and presentation of public issues via television. Methods of topic selection, research, organization of ideas and script development, alternate formats, ethical and legal constraints. Electronic news gathering (ENG) technology.

285. *Special Topics in Broadcast Journalism.* I, II, S. 1-3 hr. PR: Consent. Directed investigation of selected topics in broadcast journalism.

299. *Contemporary Media Issues and Ethics.* I, II. 2 hr. *(Required of all senior journalism majors.)* In-depth study of contemporary media issues such as right of access to media, morality in news and advertising, new FTC and FCC regulations, media responsibility to society, and social responsibility of media professionals. Individual research papers on issues with ethical considerations.

300. *Introduction to Graduate Studies.* I. (No Credit.) *(Required of all graduate journalism students.)* Designed to orient students to graduate study. (Class meets once a week.)

302. *Seminar in Communications Theory.* II. 3 hr. PR: Studies in human behavior. Communications theory drawing heavily on social psychology and sociology and anthropology. Philosophy of science. Theory as scientific knowledge. Characteristics of theory. Begin learning how to draw on experts, to apply theory.

304. *Mass Media and Society.* II. 3 hr. *(Required of all graduate journalism students.)* Study of mass media and their role in and influence on society; includes analysis of the social, political, and economic determinants of media content and character.

312. *Fund Raising and Foundation Management.* I. 3-6 hr. *(Open to graduate journalism students and to seniors with a 3.0 grade-point average; consent.)* Seminar. Studies in fund raising, alumni relations, and foundation management.

315. *Seminar in Journalism Education.* I, S. 1-3 hr. Journalism education problems. Each student does an individual research project planned to provide for professional development as a journalism teacher. Emphasis on secondary-school problems.

320. *Advanced Journalistic Writing and Research.* I, S. 3 hr. Study of advanced journalistic writing and research techniques. Students will practice the writing and research techniques on topics of their own choosing. Academic or popular topics will be selected.

337. *Eighteenth-Century Journalism.* II. 3 hr. Importance of British and American periodicals in the political, cultural, and economic patterns of the century; especially emphasizes the role of Colonial journals in reducing regionalism and forging a nation.

339. *Seminar in Advanced Advertising Management Problems.* II. 3 hr. Recently developed ideas and techniques in advertising, advertising research, and media management.

341. *Special Topics.* I, II, S. 1-6 hr.

343. *International Communications.* I. 3 hr. International news gathering and dissemination—including wire services, broadcast satellites, and political barriers—are examined, particularly as these factors affect a free exchange of information within the world community. Efforts by the United Nations to encourage news exchange and to lower news barriers will be a major case examination.

380. *Thesis.* I, II, S. 2-6 hr.

390. *Professional Project.* I, II, S. 2-6 hr. Non-thesis professional project for students preparing for some field in mass communication.

School of Medicine

The curriculum for the degree of Doctor of Medicine (M.D.) is described in the *WVU Medical Center Catalog.*

Medical Technology

The undergraduate program in medical technology is under the administration of the School of Medicine. Students are admitted into the program leading to a Bachelor of Science degree after the completion of two years of premedical technology in an accredited college or university. The WVU Medical Technology Program is accredited by the Committee on Allied Health Education and Accreditation of the American Medical Association. Graduates are eligible for certification by the Board of Registry of the American Society of Clinical Pathologists (ASCP) and by the National Certification Agency for Medical Laboratory Personnel (NCA).

The undergraduate curriculum includes the premedical technology program, which is offered in the WVU College of Arts and Sciences and at Potomac State College in Keyser and the medical technology program which is offered in the School of Medicine.

Courses of the first two years (premedical technology) may be taken in any institution of recognized standing that offers the courses required for admission into the medical technology program.

Since the course of study of the last two years is of a professional nature, students must be enrolled in the WVU School of Medicine for this entire period. The work of the junior year (the first year in the medical technology program) includes courses which introduce the student to the medical sciences and courses which prepare the student for the work of the senior year. During the senior year (the second year in the medical technology program) the student receives both didactic instruction and practical experience in the University Hospital laboratories.

Aim and Purposes

The primary aim of the program in medical technology at West Virginia University is to provide a strong undergraduate educational program in medical technology which leads to a bachelor of science degree and which provides an educational background compatible with the demands placed upon the medical technologist by the ongoing technologic revolution in laboratory medicine.

The purposes are: (1) to provide a program in medical technology which meets the academic standards of the University; (2) to provide graduate medical technologists for clinical, public health, and research laboratories; (3) to provide an educational background which enables graduates to prepare for teaching and supervisory positions in medical technology; and (4) to provide an educational background acceptable for graduate work in the medical sciences.

A program is available for certified medical technologists, who desire to complete requirements for a Bachelor of Science degree. (Further information may be obtained by contacting the Medical Technology Programs Office.)

Admission

Application for admission into the junior year (first year in the undergraduate medical technology program) should be made before the beginning of the second semester of the sophomore year in college. *Students at WVU or Potomac State College are not transferred automatically from the preprofessional course (first two years) to the professional course (third and fourth years.) Students are selectively admitted to the program for their final two years of work.*

Application forms for admission to the professional course are available after December 1 from the office of the Assistant to the Dean of Admissions and Records, Medical Center. These forms should be completed and returned to that office no later than February 1, if the student expects to enter the succeeding first semester classes.

Admission to the third year is on the recommendation of the Admissions Committee to the Dean. A personal interview with the committee is required.

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

Admission Requirements

Complete information concerning WVU admission, fees and costs, registration, regulations, etc. may be found in the *WVU Undergraduate Catalog* for the College of Arts and Sciences.

Admission requirements for the first year (premedical technology) are those for the College of Arts and Sciences.

Admission to the third year (first year of the medical technology program) is based upon two years of college work with a total of 62 hours as follows:

English. 6 hours. (Composition and rhetoric.)

Biological Science. 8 hours. (General biology or general zoology.)

Chemistry. 15-16 hours. (Inorganic chemistry, 8 hours; analytical chemistry, 3-4 hours; organic chemistry, 4 hours.) (Transfer students are required to have a complete course in organic chemistry to include aliphatic and aromatic compounds, 8 hours.)

Physics. 8 hours.

Mathematics. 3 hours. (College algebra is the minimal course requirement.) Trigonometry, or a higher mathematics course, is recommended.

Electives to complete the required hours and to meet WVU Core Curriculum requirements.

Courses such as bacteriology, parasitology, and anatomy should not be taken until after the completion of the sophomore year. A foreign language is recommended for students who plan to do graduate work.

Degree

The degree of Bachelor of Science in Medical Technology is granted to those students who have completed the prescribed curriculum and who have been recommended for the degree by the faculty of the School of Medicine.

Curriculum and Courses

For complete information concerning curriculum and courses of instruction in Medical Technology, see the *WVU Medical Center Catalog.*

Division of Physical Therapy

The Division of Physical Therapy, under the auspices of the School of Medicine, offers the final two years of a baccalaureate program leading to a degree in physical therapy.

The first two years of study may be completed in the WVU College of Arts and Sciences, or any other accredited institution which offers courses comparable to the admission requirements of the Division of Physical Therapy. To be eligible for a degree, a student must complete the final two years of the curriculum at WVU.

Admission to the third year is based upon 62 or more credit hours of study which satisfy the University's Core Curriculum requirements and the prerequisites, or their equivalent, of the Division of Physical Therapy. *Registration in the first two years does not automatically assure the student a place in the junior class. A student will be accepted on a competitive basis and selection will be based on scholastic standing and on those personal characteristics which are desirable in physical therapists.*

The student must satisfactorily complete a three-month period of clinical internship before the awarding of the baccaluareate degree. Expenses incurred during this time (room, board, and transportation) must be borne by the student. A Certificate of Proficiency in Physical Therapy then will be awarded which entitles the graduate to seek membership in the American Physical Therapy Association and to become eligible for state licensure for the practice of physical therapy. A physical therapist can practice professionally only after having passed the state board examination in the state where employment is desired.

Admission to Professional Program

A personal interview with the Admissions Committee is required. *Only those students who have at least a 2.6 grade-point average and a 2.75 science average (on a 4.0 scale) and who will have completed all the prerequisites of the Division of Physical Therapy by the current Spring Semester will be interviewed.* In addition to satisfying the prerequisite and Core Curriculum requirements, the applicant to physical therapy must also have: (1) volunteer or work experience in physical therapy and (2) scores on the Allied Health Professions Admission Test (given at major universities) which must be submitted to the Division. The Admissions Committee will advise the applicant of the time and place for the interview. Individuals who do not meet the above requirements but who believe extenuating circumstances justify admission may petititon the Admissions Committee for an interview. Reasons why the application should receive special consideration should be clearly stated in the petition.

Offical enrollment forms are available at the office of the Assistant to the Dean, Admissions and Records, Medical Center, beginning December 1 of each year. Application forms should be returned no later than March 1 in the year admission is desired.

Because of the large number of applicants and limited openings available in WVU Medical Center programs, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered.

Curriculum and Courses

For complete information concerning the curriculum and courses of instruction in Physical Therapy, see the *WVU Medical Center Catalog*.

Division of Military Science (ROTC) and Division of Air Force Aerospace Studies (ROTC)

West Virginia University offers qualified applicants two- and four-year courses of instruction in Military Science (Army ROTC) and Air Force Aerospace Studies (Air Force ROTC). Normally, successful completion of one of these courses and degree requirements leads to a commission as a second lieutenant in the U.S. Army Reserve or the U.S. Air Force Reserve. Outstanding students may be offered regular commissions.

Equivalent credit for part or all the four basic semesters of ROTC may be granted in accordance with existing military service regulations. This credit will be awarded on the basis of: prior active military service, high school ROTC, military school (Army ROTC at high school level), attendance at service academies, junior college senior division Army ROTC, or Civil Air Patrol training.

Deposit

Each ROTC student is required to pay a yearly deposit of $20.00 to cover any loss or damage to issued property in the student's possession. The deposit is paid to the WVU Controller at time of registration and is refunded upon return of undamaged property. (Army ROTC refunds the full amount if the property is returned undamaged. Air Force ROTC refunds the full amount if the property is returned undamaged and the uniform freshly cleaned as well.) Army ROTC Cadets may purchase their Class A uniforms upon successful completion of the program. Air Force ROTC Cadets (seniors) may purchase their uniforms for one-half of the actual price upon completion of the program.

Wearing of the uniform is not required for the Army ROTC basic course.

Military Science (Army ROTC)

The Military Science program at West Virginia University is designed to provide: a reserve corps of scholars, citizens, and soldiers; graduates qualified in leadership and management skills, and prepared for public service; and men and women trained to assume responsible positions as commissioned officers in the active army, army reserve, or national guard, as well as business, government, and industry.

Whether or not the student elects to take only two years of the program while at the University, for which there is no service obligation, or remain for the full four-year program to become an officer, the student is better prepared to make a meaningful contribution in the preservation of American ideals and national security. There are no uniform or haircut requirements for Army ROTC basic course cadets.

Faculty

Jerald W. Fisher, MAJ., M.A., *Assistant Professor of Military Science.*
Stephen E. Whittenberg, MAJ., B.S., *Associate Professor of Military Science.*
Kestutis J. Gedmintas, MAJ., B.A., *Assistant Professor of Military Science.*
Brian J. Austin, CPT., B.A., *Assistant Professor of Military Science.*
Allen L. Fleming, CPT., B.B.A., *Assistant Professor of Military Science.*
Rockie A. Kamai, SG.MAJ., *Noncommissioned Officer in Charge.*
Thomas M. Horn, Jr., MSG, *Senior Enlisted Instructor.*
George M. Derosia, SFC, *Senior Drill Instructor.*
Gerald W. Stidham, SFC, *Administrative Noncommissioned Officer.*
Martin L. Zamora, SSG, *Supply Sergeant.*

Scholarship Program

Competitive scholarships are available for one, two, three, and four years. The government will pay for tuition, fees, and textbooks. Additionally, the scholarship student receives $100 per month, tax free, during the academic year as a subsistence allowance. Candidates for the one-year scholarship must be enrolled in Military Science. Candidates for the two- and three-year scholarships do not have to be enrolled in Military Science, but must be qualified to enroll. Additional scholarships are available for nursing students and enlisted members of the U.S. Army Reserve or U.S. Army National Guard. Four-year scholarship competition is for high school students only. High school counselors have application forms, or write to: Professor of Military Science, Stansbury Hall, West Virginia University, Morgantown, WV 26506.

United States Military Academy, West Point

Outstanding Army ROTC students may be recommended by the Professor of Military Science for ROTC nomination to the United States Military Academy at West Point. The student must meet all academy entrance requirements before being eligible for nomination.

Basic Course (Freshmen and Sophomores Only)

The Basic Course of instruction is for freshman and sophomore students who desire to investigate the possibilities of future government service *without* committing themselves to a military service obligation. The basic course class may be added or dropped as any other courses in the University. Credits earned in ROTC count toward lower-level academic requirements. Additionally, the student gains a social awareness and develops personal values important in civilian life. Uniforms are not required in the basic course.

Army ROTC—First Year (Mil. S.)

1. 2 hr. The organization and development of the U.S. Army and ROTC from its inception to the present. The structure and role of the U.S. defense establishment with emphasis on the broad range of American civil-military relations.

2. 2 hr. The development of American military institutions, policies, experience, and traditions in peace and war are discussed. Past wars are examined in the perspective of modern military thought.

Army ROTC—Second Year (Mil. S.)

3. 2 hr. Introduction to basic leadership and management with emphasis on the fundamental concepts and skills required of today's citizen-soldier.

4. 2 hr. Continued instruction in basic fundamentals of leadership and management, with emphasis on the military application of these fundamentals. Introduction to small-unit tactics and organization.

Advanced Course (Juniors-Seniors-Veterans)

Selected students may participate in Advanced ROTC. It is required of all students who have an ROTC scholarship. Successful completion of the advanced course means earning a reserve commission as a second lieutenant in one of the fifteen branches of the Army which require over 300 occupational skills.

Advanced Course Allowances

Advanced Course students without an ROTC scholarship are given the same subsistence allowance as scholarship students. This allowance provides the student with $100 per month during the academic year.

Army ROTC—Third Year (Mil. S.)

105. 3 hr. PR: Basic course or equiv. (Equivalent credit may be granted by the WVU Dean of Admissions and Records and the Professor of Military Science on the basis of prior military service, or ROTC training other than courses in military science taken at WVU.) Examines the requirements for military training and the psychological and technical aspects of effective instruction. Additionally, the military career system and the occupational specialties options available are reviewed.

106. 3 hr. PR: Mil. S. 105 or consent. Race relations/drug abuse seminars are conducted to familiarize students with the leadership techniques involved in coping with these unique social problems. Additionally, practical training is conducted in squad- and platoon-level tactics. The course is designed to prepare the student for Advanced Camp.

Advanced Summer Camp

Before a student can be comissioned, the student must attend an advanced summer camp of 6 weeks' duration, between the junior and senior years. Cadets receive travel allowances and pay equal to one-half the basic pay of a second lieutenant. The most recent amounted to over $860.

Army ROTC—Fourth Year (Mil. S.)

107. 3 hr. PR: Mil. S. 105 and 106 or consent. Stresses the responsibilities of an officer and affords leadership experience as a cadet leader. Military staff procedures, military law, and military organizations, which prepare the student for future service, are studied.

108. 3 hr. PR: Mil. S. 107 or consent. Advanced leadership techniques, unit operations, and personnel management problems are discussed in seminars. The military role in United States foreign policy and world affairs is examined.

Leadership Laboratory

Freshman-Sophomore

Leadership training for freshman and sophomore students is designed to be challenging and adventurous. It provides opportunity for students to participate in action-oriented activities which develop self-confidence and self-discipline while encouraging the emerging leader. Rappelling, cross-country skiing, land navigation, and orientation visits to U.S. Army

installations are some of the student's choices for participation. An average of one hour a week is required. Second-semester sophomores are required to take a special military skills laboratory.

Junior-Senior

Leadership instruction is applied by the student in a working laboratory environment. Emphasis is placed on small-unit tactics, drill and ceremonies, physical training, rifle familiarization, and preparation for Advanced Summer Camp.

Two-Year Program (Sophomore and Transfer Students)

Selected students who apply will be enrolled in a two-year program that leads to an Army commission. The two-year student will attend a six-week Basic ROTC Camp. Upon successful completion of this requirement the student may enter the Advanced ROTC Program and complete the requirements for an Officer Commission during the two remaining years in school. Transfer students desiring to enter this program should contact the Professor of Military Science, Stansbury Hall, West Virginia University, Morgantown, WV 26506, before March 31 when planning on entering the University in the fall. WVU sophomores considering participation should contact the Army ROTC office early in the Second Semester.

Airborne Training

Selected cadets may voluntarily attend airborne training at Fort Benning, Georgia. Airborne training is three weeks in length; successful completion of the course results in the award of the airborne wings of a military parachutist.

Air Assault Training

Selected students voluntarily attend air assault training at Fort Campbell, Kentucky. Airmobile training is 10 days in length; successful completion of the course results in the award of the Air Assault Badge.

Veterans Program

Qualified veterans with six months or more of active military service who are WVU students may receive college credits for the first two years of Army ROTC. They immediately enter the Advanced Course and the subsistence allowance of $100 per month does not affect the benefits they receive under the GI Bill.

Aerospace Studies (U.S. Air Force)

The Air Force officer education program at West Virginia University has been in existence since 1946 and is designed to provide training that will develop managerial skills and interpersonal attitudes vital to the professional Air Force officer. It is designed to qualify those college men and women for commissioning who desire to serve in the U.S. Air Force. West Virginia University has the only Air Force ROTC (AFROTC) detachment in West Virginia.

Faculty

William T. Stanley, Col., M.S., *Professor.*
Jeffery Van Hook, Lt. Col., M.A., *Assistant Professor.*
Harry J. Shunk, Capt., M.B.A., *Assistant Professor.*
James R. Shaub, Capt., M.B.A., *Assistant Professor.*
Ernest R. Morrison, S. Sgt., *Administration Specialist.*
Robert E. Roberts, S. Sgt., *Personnel Specialist/Noncommissioned Officer in Charge.*

Scholarship Program

Outstanding students from any academic discipline may apply to and be accepted by the Professor of Aerospace Studies to compete for scholarships under this program.

A large number of scholarships are available for students majoring in an engineering, scientific, or mathematical field.

For students awarded scholarships the government will pay for tuition, fees, and textbooks, as well as provide a $100 monthly allowance.

Scholarships of this nature are available for 2, 2½, 3, and 3½ years.

Benefits

Enrolling in Air Force Reserve Officer Training Corps (AFROTC) provides the opportunity to:

1. Earn at least 8 hours of academic credit which can be applied toward the requirements of any undergraduate major at WVU.
2. Compete for AFROTC scholarships that pay full tuition, fees, required books, and $100 per month (tax free).
3. Receive free career counseling from full-time campus representatives.
4. Go on field trips to Air Force installations in the United States.
5. Try AFROTC during freshman and sophomore years without obligation.
6. Develop leadership and managerial skills in the various corps projects.
7. Compete for entry into the Professional Officer Course (POC) and earn an Air Force commission.
8. Travel, on a space available basis, aboard government aircraft (POC and scholarship cadets only).

Flight Instruction Program

Students qualified and selected for the pilot category (IP) will be given ground instruction and 13 hours of flight training at no cost. Orientation flights for advanced Senior AFROTC students who are not pilot students will be available as designated by the Professor of Aerospace Studies. It is recommended that eligible students receive ground instruction through enrollment in Mechanical and Aerospace Engineering 170, a 3-credit, FAA-approved course of instruction. An intensive, 15-hour ground instruction course for no credit is available within the Department of Mechanical and Aerospace Engineering for those students unable to enroll in the M.A.E. course. The ground instruction phase is normally completed during the second semester of the junior year. Flight training is normally taken by students during the first semester of their senior year. University credit is not given for this flight instruction.

Distinguished AFROTC Graduate

The Professor of Aerospace Studies may designate as a Distinguished Graduate a POC member who:

1. Has a superior academic record and field training education.

2. Possesses outstanding qualities of leadership and high moral character.

3. Demonstrates leadership ability through achievement in recognized campus activities, both curricular and noncurricular, which in conjunction with 1 and 2 above, warrants designation as "Distinguished."

4. Some of these graduates may be recommended for National Board competition and selection for regular commissions.

Air Force Academy

The WVU President may annually nominate five outstanding AFROTC students to be enrolled in the U.S. Air Force Academy. Applicants for the nomination are recommended by the Professor of Aerospace Studies to the WVU President during January of each year.

Veterans Program

Veterans with 180 days or more of continuous active duty military service who are rising junior students may receive college credit for the first two years of Air Force ROTC. They compete for entry into the POC for which they receive the subsistence allowance of $100 per month.

Summer Field Training

Applicants for the professional officer courses must attend a summer Field Training Course before entering the junior year. Students who have completed the freshman and sophomore years in AFROTC are assigned to a 4-week training unit; however, students who did not participate as freshmen or sophomores must attend a more intensive 6-week course. The Air Force furnishes uniforms, housing, medical care, and rations in addition to giving students round-trip travel allowance and military pay. Students who successfully complete Field Training then become eligible for the professional officer course.

Curriculum

The curriculum in Air Force Aerospace Studies is divided into three distinct areas: General Military Course, Leadership Laboratory, and Professional Officer Course. In addition, each cadet must take and successfully complete a course in English composition, or its equivalent, before completing the General Military Course and must complete a course in mathematical reasoning before graduation and commissioning.

General Military Course (GMC)

The Air Force course of study offered during the freshman and sophomore years is the General Military Course (GMC). This is composed of one class hour and one corps training hour per week. Two credit hours are allowed for each semester course successfully completed. Four semesters of the GMC is one method of admission to the POC. However, a two-year POC option is available for those students who do not complete the GMC.

GMC—First Year (AFROTC) (AFAS)

1. 2 hr. The Air Force in the contemporary world through a study of the total force structure, strategic offensive and defensive forces, general purpose forces, aerospace support forces and separate operating agencies. (Also includes Leadership Laboratory as described below.)

2. 2 hr. Continuation of AFAS 1.

GMC—Second Year (AFAS)

3. 2 hr. The development of air power from dirigibles and balloons through the peaceful employment of U.S. air power in relief missions and civic actions programs in the late 1960's and the air war in Vietnam; leadership and managerial communicative skills are stressed by having students prepare both written and oral presentations. (Also includes Leadership Laboratory as described below.)

4. 2 hr. Continuation of AFAS 3.

Leadership Laboratory

Leadership Laboratory is taken an average of one hour per week throughout the student's enrollment in AFROTC. Instruction is conducted in an organized cadet corps with a progression of experiences designed to develop each student's leadership potential. Leadership Laboratory involves a study of air force customs and courtesies; drill and ceremonies; career opportunities; and the life and work of an air force junior officer. Students develop leadership potential in a practical, supervised training laboratory, which typically includes field trips to air force installations throughout the United States.

Professional Officer Course

The Professional Officer Course (POC) corresponds to the junior and senior years of a student's academic program. Enrollment in the advanced course also is open to graduate students if they have four semesters of school remaining.

The POC is designed to provide highly qualified junior officers for the U.S. Air Force. Enrollment is based on such factors as scholarship, physical qualifications, leadership, desire for flying training, and academic major. Successful completion of the advanced course qualifies the student for appointment as a second lieutenant in the U.S. Air Force when he/she receives his/her college degree.

Instruction averages three hours per week throughout the four semesters, in addition to the required Leadership Laboratory hours. Three hours of credit are allowed for each of the four semesters of work in the advanced program subsequent to acceptance by a school or college in the University.

To be eligible for enrollment into the POC, students must meet the following requirements:

1. Make application for the POC as soon as possible (usually during the sophomore year), taking into consideration the following items:
   a. Have a 2.0 cumulative grade-point average.
   b. Have two years (4 semesters) of undergraduate or graduate school remaining.
   c. Be under 30 years of age at the time of commissioning, except that pilot and navigator applicants must not be older than 26½ years when commissioned.

2. Pass the Air Force Officer Qualifying Test.
3. Pass an Air Force medical examination.
4. Be accepted by the Professor of Aerospace Studies.
5. Complete the GMC and/or Field Training (4 weeks for 4-year applicants; 6 weeks for 2-year applicants).
6. Agree to accept a commission as a second lieutenant in the USAF and serve at least four years if not on flying status, or five years after completing navigator training or six years after completing pilot training.
7. Enlist in the Air Force Reserve (8 years for scholarship recipients; 6 years for nonscholarship students).

POC—Third Year (AFROTC) (AFAS)

105. 3 hr. PR: GMC or equiv. (Equivalent credit may be granted by WVU Dean of Admissions and Records and the Professor of Aerospace Studies on the basis of prior military service or ROTC training other than courses in Aerospace Studies taken at WVU.) Course focuses on military leadership, management, and the progressive development of communicative skills needed by junior officers. It emphasizes the individual as a manager in the Air Force. The individual motivational and behavioral processes, leadership, communication and group dynamics are covered to provide a foundation for the development of the junior officers' professional skills as an Air Force officer. Organizational power, politics and managerial strategy and tactics are discussed within the context of business and military organizations. Students will make field trips, prepare individual and group presentations for class, write reports, and participate in group discussions, seminars and conferences. (Also includes Leadership Laboratory as previously described.)

106. 3 hr. PR: AFAS 105 or consent. Continuation of AFAS 105.

POC—Fourth Year (AFAS)

107. 3 hr. PR: AFAS 105 and 106 or consent. The course examines military professionalism and existing patterns of civil-military relations; analyzes the international and domestic environments affecting U.S. defense policy; examines the post-World War II development of defense strategy and the methods of managing conflict. Students will prepare individual and group presentations for the class, write reports, and participate in group discussions, seminars, and conferences. (Also includes Leadership Laboratory as previously described.)

108. 3 hr. PR: AFAS 105, 106, 107 or consent. Continuation of AFAS 107.

College of Mineral and Energy Resources

Today's opportunities in the mineral industries have never been better. Moreover, these opportunities are very likely to grow in the future as minerals and fuels become scarcer and competing uses for land displace mineral operations, and as concerns over environmental control and conservation of resources increase. With America placing more importance on domestic sources of materials and energy, mineral engineering graduates have an opportunity to become part of one of our nation's most vital industries.

Mineral engineering brings into play a broad range of skills and activities—planning, supervising, and operating mineral extraction processes, both above and below ground. Mining engineering is the science of extracting solid fuels and minerals from the earth's crust such as coals, oil shale, precious metals, and ores of iron, copper, aluminum, and uranium. Students interested in petroleum or natural gas engineering courses in the College of Mineral and Energy Resources will cover the exploration, drilling, production, and transportation of oil and natural gas.

Mineral processing deals in the initial treatment of minerals as they are extracted from the earth, including extractive metallurgy, coal preparation, mineral beneficiation, and energy conversion processes. Mineral and material recycling is likely to become an area of major emphasis in future years.

Mineral resource economics studies the economics of the mineral industries, commodity markets, and the economic evaluation of resources in their broadcast aspects as affected by engineering technology, earth sciences, and national policy. Thus, it ties together the geology of resources, the engineering of extraction and conversion processes, and the demands of industrial societies through mineral markets and trade.

Located in the center of one of the greatest mineral producing areas of the country, the College of Mineral and Energy Resources is near industrial, mining, and petroleum and natural gas-producing areas. The college has a cooperative program with participating companies that permits students to attend WVU one semester and work for the participating company the other semester. The money earned, in most cases, takes care of a student's educational expenses. Summer employment is also available. A number of the largest oil and gas companies throughout the United States provide summer employment for students enrolled in the petroleum engineering program.

Faculty

Administrative Officers

George Fumich, Jr., J.D. (WVU), *Dean.*
Royce J. Watts, M.S. (WVU), *Associate Dean—Administration.*

General Minerals

Patrick R. Esposito, Ph.D. (WVU), *Associate Professor; Chairperson.*

Mining Engineering

Syd S. Peng, Ph.D. (Stanford U.), *Professor; Chairperson.*
Lawrence Adler, Ph.D. (U. Ill.), *Professor.*
Donald M. Bondurant, P.E., M.S.E.M. (WVU), *Associate Professor.*
Charles T. Holland, P.E., M.S.E.M. (WVU), *Dean Emeritus.*

Jay Hilary Kelley, Ph.D. (Penn St. U.), *Distinguished Professor.*
Joseph W. Leonard, P.C.A., M.S.E.M. (Penn St. U.), *William N. Poundstone Research Professor.*
Joseph D. McClung, P.E., M.S.E.M. (U. Pitt), *Associate Professor Emeritus.*
A. Wahab Khair, Ph.D. (Penn St. U.), *Research Associate Professor.*
Ronald R. Rollins, Ph.D. (U. Utah), *Professor.*
Ernest J. Sandy, P.E., M.S.E.M. (U. Pitt), *Associate Professor.*
Y. J. Wang, P.E., Ph.D. (Penn St. U.), *Associate Professor.*

Petroleum Engineering

Seadat Ameri, M.S.Pet.E. (WVU), *Associate Professor; Acting Chairperson.*
Robert W. Chase, Ph.D. (Penn St. U.), *Adjunct Assistant Professor.*
Patrick R. Esposito, P.E., Ph.D. (WVU), *Associate Professor.*
Walter K. Sawyer, M.S. (WVU), *Adjunct Associate Professor (part-time).*
Khalid O. Siddiqi, Ph.D. (La. Tech), *Visiting Assistant Professor.*
James A. Wasson, P.E., M.S.P.N.G. (Penn St. U.), *Professor.*
Larry Woodfork, A.M. (Ind. U.), *Adjunct Associate Professor.*

Mineral Resource Economics

Adam Z. Rose, Ph.D., M.A. (Cornell U.), *Associate Professor; Chairperson.*
David X. Kolk, Ph.D. (U. Calif.), *Visiting Assistant Professor.*
Walter C. Labys, Ph.D. (Nottingham U., Eng.), *Professor.*
William H. Miernyk, Ph.D. (Harvard U.), *Claude Worthington Benedum Professor.*
Barry D. Solomon, Ph.D. (Ind. U.), *Visiting Assistant Professor.*

Mineral Processing Engineering

Ronald R. Rollins, Ph.D. (U. Utah), *Professor; Chairperson.*
Eung Ha Cho, Ph.D. (U. Utah), *Assistant Professor.*
Richard B. Muter, M.S. (WVU), *Associate Professor.*
Felicia F. Peng, Eng. (Stanford U.), *Research Assistant Professor.*

Coal Research Bureau

George Fumich, Jr., J.D. (WVU), *Acting Director; Dean.*
William F. Lawrence, B.S. (Waynesburg C.), *Assistant Director; Engineering Scientist.*
Richard B. Muter, M.S. (WVU), *Acting Associate Director; Associate Professor; Engineering Scientist.*
David J. Akers, Jr., M.S. (WVU), *Engineering Scientist.*
William H. Buttermore, B.S. (WVU), *Engineering Scientist.*
David L. Durham, B.A. (WVU), *Coal Research Technologist.*
Mary Alice Hannah, B.S. (WVU), *Coal Research Technologist.*
Charles R. McFadden, B.S. (WVU), *Engineering Scientist.*
Barry B. McMillan, B.S. (WVU), *Engineering Scientist.*
Marilyn Maloy, B.S. (WVU), *Coal Research Technologist.*
Larry L. Nice, M.B.A. (WVU), *Engineering Scientist.*
Robert G. Perina, B.A. (WVU), *Coal Research Technologist.*
Edward Simcoe, B.A. (WVU), *Research Associate.*
Thomas Simonyi, B.A. (Earlham C.), *Coal Research Technologist.*
John F. Slonaker, B.A. (Wash. & Jeff. C.), *Engineering Scientist.*
Elizabeth J. Wright, B.A. (Seton Hill C.), *Coal Research Technologist.*

Mining and Industrial Extension

George Fumich, Jr., J.D. (WVU), *Director; Dean.*
Thomas L. Savage, B.S. (Cornell U.), *Associate Director; Assistant Professor.*
Cynthia M. Bindocci, M.A. (WVU), *Instructor.*
Joseph C. Dorton, B.S. (Concord C.), *Assistant Professor.*
Glen D. Elliott, Ph.D. (WVU), *Lecturer.*
Robert L. Halstead, B.S. (Morris Harvey C.), *Associate Professor.*

James H. Kincaid, B.S. (W. Va. Tech.), *Assistant Professor.*
Albert H. Kirchartz, (Fairmont St. C.), *Lecturer.*
Michael J. Klishis, Ph.D. (WVU), *Assistant Professor.*
Peter P. Mintreas, B.S. (WVU), *Assistant Professor.*
William E. Moser, B.S.B.A. (Robt. Morris C.), *Instructor.*
Herman P. Sparks, M.A. (WVU), *Assistant Professor.*

ABET Accreditation

The Accreditation Board for Engineering and Technology (ABET), a joint body concerned with the enhancement of the status of the engineer and the engineering profession, has been designated by the professional engineering societies as the coordinating agency for the accreditation of undergraduate engineering curricula in the United States. The mining and petroleum engineering curricula are fully accredited by the ABET.

Admission

General Requirements

All prospective students must be qualified for admission to West Virginia University and present secondary school credits for 2 units of algebra, 1 unit of geometry, ½ unit of trigonometry or advanced mathematics; and 1 unit of chemistry.

Additional freshman-year admission requirements for West Virginia residents and out-of-state residents, plus special admission policies for transfer students, are noted below. It should be noted that admission policies vary between the Mining and Mineral Processing Engineering and the Petroleum Engineering programs.

Mining and Mineral Processing Engineering

First-Year Students

All applicants must take the Standard ACT test and submit official copies of ACT test scores to the Office of Admission and Records before an admission decision will be made. An automatic admission to the College of Mineral and Energy Resources will be based on the following:

West Virginia Residents: Achievement of a Standard ACT Mathematics score of 24 or better *or* achievement of a high school grade-point average of 2.75 or better at graduation, *and* eligibility for enrollment in Mathematics 15, Single Variable Calculus, as determined by the standard WVU Mathematics Placement Examination.

Out-of-State Residents: Achievement of a Standard ACT Mathematics score of 26 or better *or* achievement of a high school grade-point average of 3.0 or better at graduation, *and* eligibility for enrollment in Mathematics 15, Single Variable Calculus, as determined by the standard WVU Mathematics Examination.

First-year students who satisfy the ACT Mathematics or high school grade-point average requirements, but are not eligible for enrollment in Mathematics 15, may enroll in the Pre-COMER Program of the College of Arts and Sciences and attempt to gain admission to the College of Mineral and Energy Resources as transfer students, as noted below.

Transfer Students

Students desiring to transfer into the Mining and Mineral Processing Engineering Programs in the College of Mineral and Energy Resources from another WVU college or school, including the Pre-COMER Program of the

College of Arts and Sciences, or an outside college or university, must satisfy both the WVU general admission requirements and as a *minimum:*

1. Have a grade-point average of 2.75 or higher for all college-level work attempted.

2. Have completed Mathematics 15 and 16 and Chemistry 15 and 16 *or* Physics 11 and 12 (or their equivalent) with an average of 2.5 or better in each of the mathematics and chemistry *or* physics areas.

Petroleum Engineering

First-Year Students

All applicants must take the Standard ACT test and submit official copies of ACT test scores to the Office of Admissions and Records before an admission decision will be made. An automatic admission to the College of Mineral and Energy Resources will be based on the following:

West Virginia Residents: Achievement of a Standard ACT Mathematics score of 24 or better *or* achievement of a high school grade-point average of 3.0 or better at graduation, *and* eligibility for enrollment in Mathematics 15, Single Variable Calculus, as determined by the standard WVU Mathematics Placement Examination.

Out-of-State Residents: Achievement of a Standard ACT Mathematics score of 28 or better *or* achievement of a high school grade-point average of 3.4 or better at graduation, *and* eligibility for enrollment in Mathematics 15, Single Variable Calculus, as determined by the Standard WVU Mathematics Placement Examination.

First-year students who satisfy the ACT Mathematics or high school grade-point average requirements, but are not eligible for enrollment in Mathematics 15, may enroll in the Pre-COMER Program of the College of Arts and Sciences and attempt to gain admission to the College of Mineral and Energy Resources as transfer students, as noted below.

Transfer Students

Students desiring to transfer into the Petroleum Engineering Program in the College of Mineral and Energy Resources from another WVU college or school, including the Pre-COMER Program of the College of Arts and Sciences, or an outside college or university, must satisfy both the WVU general admission requirements and as a *minimum:*

1. Have a grade-point average of 3.0 or higher for all college-level work attempted.

2. Have completed Mathematics 15 and 16 and Chemistry 15 and 16 *or* Physics 11 and 12 (or their equivalent) with an average of 2.5 or better in each of the mathematics and chemistry *or* physics areas.

All Students

1. A student will not be permitted to register for a Petroleum Engineering course, except Pet. E. 100, until the student has successfully completed Chemistry 141 and 142.

2. A student will not be considered totally admitted to the Petroleum Engineering program until the student has been accepted in at least one Petroleum Engineering course.

Admission Petitions

Students not meeting the minimum transfer requirements for Mining and Mineral Processing Engineering and Petroleum Engineering as described above, but who demonstrate special aptitude for engineering studies, may

request to be admitted to the College of Mineral and Energy Resources by written petition to the Dean. Following receipt of the written petition, the applicant will be scheduled for a personal interview with the appropriate departmental chairperson if he/she desires.

Application Deadlines

Applicants for transfer student admission to the College of Mineral and Energy Resources must be received according to the schedule below:

Desired Date of Entry	*Deadline Date for Receipt of Application*
Summer Session or First Semester	Preceding March 15
Second Semester	Preceding November 1

The number of transfer students accepted into the College of Mineral and Energy Resources will be governed by the enrollment capacities of each of the three undergraduate engineering programs. First admission priority will be granted to those students currently matriculated at WVU and in pre-engineering programs at state colleges and universities within West Virginia; second priority to students enrolled in pre-engineering type programs at non-state institutions; and third priority to students in non-engineering curricula at external colleges and universities. Within the three categories cited above, preferential admission will be in the following order: West Virginia residents, non-West Virginia U.S. residents, and foreign students.

Complete information concerning WVU admission, registration, fees and expenses, and regulations is contained in Part 2 of the *WVU Undergraduate Catalog*.

Requirements for Degrees

In order to be eligible for a bachelor's degree, any student shall be required to complete satisfactorily the number of semester hours of work as specified in the curriculum of the program leading to the degree for which the student is a candidate, plus the general requirements of physical education and English.

Curricula

The following engineering curricula are offered in the College of Mineral and Energy Resources:

1. A four-year curriculum leading to the degree of Bachelor of Science in Engineering of Mines.
2. A four-year curriculum leading to the degree of Bachelor of Science in Petroleum Engineering.
3. A four-year curriculum leading to the degree of Bachelor of Science in Mineral Processing Engineering.

The first two years of instruction are very similar in the programs. During this period the student is given a thorough grounding in mathematics, geology, physics, and chemistry. During the third and fourth years, the student is given instruction in the engineering sciences as well as in the professional subjects. Also, studies in the humanities are continued with the student being permitted to elect a reasonable proportion of the subjects to be studied.

The mineral and energy resources programs offer professional and general electives at both the lower- and upper-division levels to all students in the areas of mineral and energy economics, mineral resources appraisal and exploration, design of mineral process operations, and models of mineral commodity markets.

Engineering of Mines

Degree: Bachelor of Science in Engineering of Mines

Mining engineering deals with discovering, extracting, beneficiating, marketing, and utilizing minerals from the earth. The role of the mining engineer is quite diversified and there are opportunities for technical specialization in prospecting, development, production, beneficiating, utilization, marketing, and safety. Therefore, the mining engineer must be well trained in the fields of mining and geology and also in the principles of civil, electrical, and mechanical engineering as applied to the mining industry. With the present trend toward the use of engineers in industrial management and administrative positions, the mining engineer's training also must include economics, business, personnel management, and the various humanities.

Professional study includes geology and the engineering principles of blasting, materials handling, transportation, hoisting, water control, surface and underground systems of mining, roof control, rock mechanics, ventilation, mineral preparation, and plant design.

Students also receive an introduction to the managerial, financial, environmental, and social aspects of the operation of a mining enterprise through courses incorporated into the curriculum.

In the fourth year, the student may specialize in coal mining, ore mining, or other phases of mining engineering by proper selection of design problems and electives. The student will be assigned an adviser who will assist in this phase of the program.

Local coal fields, mines, and preparation plants are used extensively for experimental, instructional, and field work.

Mining Engineering

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4	Math. 17	4	Math. 18	4
Math. 15	4	Math. 16	4	Phys. 11	4	Phys. 12	4
Engl. 1	3	M.A.E. 41	3	Engl. 2	3	M.A.E. 42	3
Geol. 1	3	M. 2	3	E.M. 103	3	E.M. 104	3
M. 1	3	G.P.E. 2 (Opt.)	1	Geol. 151	4	Core elect.	3
G.P.E. 1 (Opt.)	1	Core elect.	3				
	18		18		18		17

Miner's Safety and Qualification Course—0 hr.

SUMMER

E.M. 102—3 hr.

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
I.E. 213/Stat. 201	3	E.M. 211	3	E.M. 226	3	E.M. 296	3
E.E. 105	4	E.M. 225	3	E.M. 231	3	Prof. elect.	3
M.A.E. 114	3	E.M. 242	3	E.M. 271	3	Tech. elect.	3
M.A.E. 43	3	I.E. 281	3	Prof. elect.	3	Core elect.	6
E.M. 206	3	Core elect.	6	Core elect.	6		
	16		18		18		15

Total: 141 hr.

Professional Electives consist of all the non-required courses and other courses in the College that have the prior approval of the mining engineering faculty.

Technical Electives: An approved list of technical electives is available at the department office.

Petroleum Engineering

Degree: Bachelor of Science in Petroleum Engineering

Petroleum engineering deals with the discovery, production, and transportation of oil and natural gas. Consequently, the petroleum engineer must be thoroughly familiar with the principles of geology as related to the occurrence, discovery, and production of natural gas and petroleum. This knowledge is obtained by the study of geology as well as by the study of geological principles developed in courses relating to oil development and production. In addition, the petroleum engineer must be well grounded in the principles of oil and gas production, as well as in the technology of transportation. This training may be obtained in the several courses pertaining to petroleum technology and in natural gas engineering and distribution, as well as the courses given in the engineering and basic sciences and in mathematics. There is a strong trend toward employing petroleum engineers as supervisors, managers, and executives. Education for this type of career is provided by the courses in property evaluation, as well as in the humanities. In the senior year, electives are provided in which the student may obtain additional training in management, in supervisory skills, or in some special phases of petroleum and natural gas technology. Assistance in this phase of the program will be given by an adviser assigned to the student.

The College of Mineral and Energy Resources is particularly fortunate that West Virginia is a petroleum and natural gas producing state, and as a result local production and gas storage fields, secondary recovery projects, and compressor stations provide excellent opportunities for field study of petroleum engineering problems, techniques, and methods. The petroleum laboratories of the college are well equipped for laboratory study of gas measurement apparatus and for core analysis, as well as for the study of drilling muds and reservoir fluids.

Petroleum Engineering

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4	Math. 17	4	Math. 18	4
Math. 15	4	Math. 16	4	Phys. 11	4	Phys. 12	4
Engl. 1	3	Engl. 2	3	M.A.E. 41	3	M.A.E. 42	3
Geol. 1	3	M. 2	3	Geol. 151	4	M.A.E. 114	
M. 1	3	G.P.E. 2	1			(Pet.E. 215)	3
G.P.E. 1	1	Core elect.	3			Core elect.	3
	18		18		15		17

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 141	3	Engl. 208	3	I.E. 213	3	Pet.E. 216	3
Chem. 142	1	Geol. 272	3	M.A.E. 101	3	Prof. elect.	3
M.A.E. 43	3	I.E. 281	3	Prof. elect.	4	Core elect.	9
Pet.E. 210	3	Pet.E. 211	3	Pet.E. 244	1		
Pet.E. 212	2	Pet.E. 235	3	Core elect.	6		
Pet.E. 233	3	Prof. elect.	3				
Pet.E. 236	3						
	18		18		17		15

Recommended Professional Electives: M. 250; Pet.E. 207, 224, 234, 241, 300, 340, 342, 343, 362; M.E.R. 101, 222.

Mineral Processing Engineering

Degree: Bachelor of Science in Mineral Processing Engineering

The mineral processing engineer designs, directs, and operates the processes of producing refined products from raw resources. Utilizing raw materials supplied from the extraction industries such as mining, mineral processing refines or beneficiates the raw material into an enriched concentrate. Physical or chemical separations may be employed in mineral processing engineering which include comminution, sizing, concentration, solid/liquid separation, hydometallurgy, and pyrometallurgy.

At the College of Mineral and Energy Resources of West Virginia University, major emphasis is given to coal cleaning, ore beneficiation, and hydrometallurgy. Common techniques such as sampling, size reduction, and fine particle separations are explained. Ore beneficiation techniques such as froth flotation and surface chemistry are thoroughly covered, and for both coal preparation and ore beneficiation the fundamentals of gravity concentration as well as slurry treatment are emphasized. Hydrometallurgical applications such as batch-leaching, counter-current-solvent-extraction and recovery processes are presented in detail along with the types of equipment employed. Equipment performance, flow sheet design, plant design, and overall economics, in all the areas of mineral processing are stressed.

Mineral processing engineering is a challenging field in which graduates are much in demand, and where state, regional, and national needs are far from being met. Potential employers include coal companies, metallurgical companies, chemical companies, utilities, research institutes, universities, and state or federal agencies.

Research studies in this department include coal cleaning, mineral identification, mineral beneficiation, coal and solid waste utilization, flotation, desulfurization, and agglomeration of coal.

Mineral Processing Engineering

FIRST YEAR				SECOND YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
Chem. 15	4	Chem. 16	4	Math. 17	4	Math. 18	4
Math. 15	4	Math. 16	4	Phys. 11	4	Phys. 12	4
Engl. 1	3	Engl. 2	3	M.A.E. 41	3	M.A.E. 42	3
Geol. 1	3	M. 2	3	M.P.E. 217	3	M.P.E. 218	4
M. 1	3	G.P.E. 2	1	Chem. 141	3	Core elect.	3
G.P.E. 1	1	Spch. 11	1	Chem. 142	1		
		Spch. 14	2				
	18		18		18		18

THIRD YEAR				FOURTH YEAR			
First Sem.	*Hr.*	*Second Sem.*	*Hr.*	*First Sem.*	*Hr.*	*Second Sem.*	*Hr.*
I.E. 281	3	E.E. 105	4	M.P.E. 219	3	M.P.E. 220	4
Engl. 208	3	M.P.E. 222	3	M.P.E. 270	3	M.P.E. 250	3
M.A.E. 43	3	Chem. 131	4	M.A.E. 114	3	Prof. elect.	3
M.A.E. 140	3	Hist. 175	3	Prof. elect.	3	Core elect.	3
M.P.E. 221	4	Core elect.	3	Core elect.	3	Core elect.	3
	16		17		15		16

Total: 136 hr.

Recommended Professional Electives: M. 250; E.M. 224; Ch.E. 224. All M.P.E. undergraduate courses.

University Core Curriculum Course

The following course in the College of Mineral and Energy Resources meets the University criteria to qualify for Core Curriculum credit:

Mineral Resource Economics: M.E.R. 97—*Core B.*

Courses of Instruction in Mineral and Energy Resources

Minerals (M.)

1. *Mineral Engineering Problem Solving.* I. 3 hr. Freshman orientation to the College of Mineral and Energy Resources including grade-point calculation, University registration procedures, *WVU Student Handbook*, financial aid, student chapter of AIME, academic programs in the College, library programs, mineral and energy conservation, dimensional relationships, basic dimensional analysis, basic engineering graphics, vectors, descriptive geometry, area and volume, sedimentary rocks and map interpretation, drafting and lettering. 2 hr. lec., 3 hr. lab.

2. *Mineral Engineering Problem Solving.* II. 3 hr. PR or Conc.: Math. 15. Principles of surveying and introduction to FORTRAN programming. 2 hr. lec., 3 hr. lab.

250. *Evaluation of Capital and Operating Costs.* I, II. 3 hr. PR: Math. 18 or consent. Estimating capital and operating costs of mineral industries. Evaluation of potential investments, comparisons of investment alternatives, estimation of profitability, and payout of new ventures. Special problems of investment decisions in mining, petroleum, and other facets of the mineral industries. 3 hr. lec.

Engineering of Mines (E.M.)

102. *Mine Surveying.* SI. 3 hr. PR: M. 2, Math. 15. Surface and subsurface surveying, celestial observations, and related calculations together with intensive field practice in underground and surface surveying. Lectures and field work arranged.

103. *Surface Mining.* I, II. 3 hr. PR: Math 16, Geol. 151. Surface mining methods with emphasis on planning, production, and equipment systems.

104. *Underground Mining.* I, II. 3 hr. PR: Geol. 151, M. 2, Math. 16. Underground mining methods for both bedded deposits and ore bodies; consideration of factors in the design (development) phase and production (exploitation) phase of an underground mining operation; application of mining machinery.

191. *Special Topics.* I, II. 1-3 hr. PR: Junior or senior standing, consent. *(Undergraduate majors only.)* Selected fields of study in mining engineering.

204. *Mining Methods for Vein Deposits.* I. 3 hr. PR: M. 2, Math. 16. Methods and systems of mining other than flat seams. Emphasis on selection of methods in relation to cohesive strength of ore bodies and their enclosing wall rocks. Mining of anthracite included.

205. *Coal Mining.* I. 3 hr. PR: Junior standing or consent. *(Not open to mining engineering students.)* Introduction to elements of coal mining.

206. *Mining Exploration.* I. 3 hr. PR: E.M. 103, 104, Phys. 12, Math. 16. All phases of mineral exploration. Geological and geophysical methods, exploration drilling, data reduction and interpretation, preliminary feasibility studies and evaluation.

211. *Ground Control.* I, II. 3 hr. PR: E.M. 103, 104, M.A.E. 41, 43, Geol. 151. Rock properties and behavior, *in situ* stress field, mine layout and geological effects; designs of entry and pillar and roof bolting, convergence of openings and surface subsidence engineering.

214. *Rock Mechanics.* II. 3 hr. PR: M.A.E. 43 or consent. Elastic and plastic properties of rock, Mohr's criteria of failure, elastic theory, stress distributions around underground openings, open pit and underground stability, rock testing techniques.

217. *Geotechnics for Mining Engineers.* I. 3 hr. PR: Geol. 1, Phys. 11, Math. 16. Characteristics of earth material, geotechnics and geology concerning mine design, mine refuse disposal, slope stability, and other earth structures. Groundwater hydrology for mining application.

224. *Special Subjects for Mining Engineering.* I, II. 1-6 hr. PR: Senior or graduate standing or consent. Special problems in mining engineering, including choices among operations research, mine systems analysis, coal and mineral preparation, and coal science and technology.

225. *Mining Equipment.* II. 3 hr. PR: E.E. 105, E.M. 103, 104, M.A.E. 43, junior standing. Selection or evaluation of mobile excavating and bulk handling equipment. Matching job conditions to equipment characteristics. It includes drills, continuous miners, loaders, cutters, front-end loaders, scrapers, slushers, shovels, draglines, trucks, shuttle cars, and railroads.

226. *Mine Machinery.* I. 3 hr. PR: E.E. 105, E.M. 103, 104, M.A.E. 43, junior standing. Design and control of fixed and integrated excavating and bulk handling machinery. Analysis includes components, operation, production, and possible failure modes. Studied are conveyors, hoists, hydraulic transport, boring machines, longwalls, bucket wheel excavators, and dredges.

227. *Advanced Mining Equipment Applications.* II. 3 hr. PR: E.M. 225, 226. Structural, mechanical, hydraulic, and electrical characertistics of the more common items of mining equipment. Controls, electrical and hydraulic circuits, and mechanical transmissions with associated problems. Laboratory design of a control system for a mining machine.

231. *Mine Ventilation.* I, II. 3 hr. PR: E.M. 104, M.A.E. 114. Engineering principles, purposes, methods, and equipment applied to the ventilation of mines.

242. *Mine Health and Safety.* II. 3 hr. PR: E.M. 103, 104. The nature of the federal and state laws pertaining to coal mine health and safety; emphasis will be placed on achieving compliance through effective mine planning, design, and mine health and safety management.

243. *Industrial Safety Engineering.* I. 3 hr. PR: Junior standing or consent. Problems of industrial safety and accident prevention, laws pertaining to industrial safety and health, compensation plans and laws, and industrial property protection.

251. *Explosive Engineering.* I, II. 3 hr. PR: Chem. 16, Phys. 12, M.A.E. 42. Theory and application of explosives, composition properties and characteristics of explosives, blasting design fundamentals, legal and safety considerations.

271. *Mine Management.* I. 3 hr. PR: E.M. 103, 104. Economic, governmental, social, and cost and labor aspects of mining as related to the management of a mining enterprise.

276. *Mine and Mineral Reserve Valuation.* I, II. 3 hr. PR: Senior standing. Methods used to value mineral properties; factors affecting value of mineral properties.

286. *Fire Control Engineering.* II. 3-4 hr. PR: Senior standing. Aspects involved in the control from fire, explosion, and other related hazards. Protective considerations in building design and construction. Fire and explosive protection organization including fire detection and control. Lectures (3) and/or 3 hr. lab.

287. *Applied Geophysics for Mining Engineers.* II. 3 hr. PR: E.M. 103, 104, Phys. 12, Geol. 151 or consent. Origin of the universe and the planets, heat and age of the earth. Application of the science of geophysics in the location and analysis of earthquakes and in prospecting for oil and minerals.

291. *Mine Plant Design.* I, II. 3 hr. PR: E.M. 225, 226, senior standing. Layout, analysis and detailing of the major mine installations, and support facilities. Locations include: the surface plant, shaft and slope stations, section centers. Systems dealt with are bulk handling power, ventilation, supplies, water, and personnel.

296. *Mine Design.* I, II. 3 hr. PR: E.M. 206, 211, 225, 226, 231, 242, 271. Comprehensive design problem involving underground mining developments or surface plant or both, as elected by the student in consultation with instructor. Preparation of a complete report on the problem required, including drawings, specifications, and cost analysis.

311. *Advanced Ground Control—Coal Mines.* I. 3 hr. PR: E.M. 211 or consent. Ground and strata control for underground and surface coal mining, including slope stability and subsidence.

316. *Advanced Rock Mechanics.* II. 3 hr. PR: E.M. 214 or consent. Testing techniques and interpretation, strength and fracture, classification, anisotropy, friction, jointed rock, fluid pressure, fragmentation, and excavation.

320. *Mobile Excavating and Materials Handling.* I. 3 hr. PR: Graduate standing and consent. Mobile mining equipment will be systematically analyzed as to functional, production, failure, and operational aspects. Included will be routine and innovative methods, and surface and underground applications, such as the hydraulic shovel and impactors.

321. *Integrated Excavating and Materials Handling.* II. 3 hr. PR: Graduate standing and consent. Integrated mining equipment will be systematically analyzed as to functional, production, failure, and operational aspects. Included will be routine and innovative methods, and surface and underground applications, such as the longwalls and monorails.

331. *Mine Ventilation Network Analysis.* I, II. 3 hr. PR: E.M. 231, I.E. 281, or consent. Theory and computational techniques for mine ventilation network problems with emphasis on computer-aided analysis of complex mine ventilation systems.

332. *Advanced Mine Ventilation.* I, II. 3 hr. PR: E.M. 231. Advanced topics in mine atmospheric control including control of methane, dust, humidity and heat. Also covers leakage characteristics, fan selection analysis of ventilation networks, and planning of mine ventilation system.

342. *Advanced Mine Health and Safety.* I. 3 hr. E.M. 242 or graduate standing. Special emphasis will be placed on mine rescue, mine disaster prevention and organization, and mine property and equipment loss prevention.

351. *Explosive Engineering Design.* II. 3 hr. PR: E.M. 251 or consent. Rock drilling, total blast systems simulation, experimental studies in blast design, rock fracturing, chemical thermodynamics, kinetics, and reaction rates.

365. *Deterministic Methods for Mineral Engineers.* I. 3 hr. PR: Graduate standing or consent. Analysis and solution of mineral engineering problems which require use of deterministic models. Application of deterministic methods to mineral transportation, mineral resource allocation and extraction problems, and mine planning and equipment utilization problems.

366. *Stochastic Methods for Mineral Engineers.* II. 3 hr. PR: Graduate standing or consent. Application of stochastic methods to mineral engineering problems in equipment selection, renewal processes, mine ventilation, mine production, and mineral extraction.

391. *Advanced Mine Design.* I. 1-6 hr. PR: Graduate standing or consent. Advanced detail design and layout of coal mine plant, particularly incorporating new ideas of machines and mining methods.

392. *Advanced Mine Design.* II. 1-6 hr. PR: Graduate standing or consent. Advanced detail design and layout of coal mine plant, particularly incorporating new ideas of machines and mining methods.

394. *Special Topics.* I, II, S. 1-3 hr. PR: Graduate standing or consent. Selected field of study in mining engineering.

Petroleum Engineering (Pet.E.)

100. *Introduction to Petroleum Engineering.* II, S. 3 hr. PR: Sophomore standing. Introduction; origin, migration, and accumulation of petroleum; reservoir fluids properties; properties of reservoir rocks; exploration; drilling technology; reservoir engineering; well completions; production engineering; surface facilities; transportation. Open to all students.

207. *Natural Gas Engineering.* I. 4 hr. PR: Pet.E. 211, M.A.E. 114. Principles of natural gas production, transmission, distribution, processing, regulation, measurement, storage, and analysis with a laboratory devoted to principles of equipment utilized in the operations. 3 hr. lec., 3 hr. lab.

210. *Drilling Engineering.* I, II. 3 hr. PR or Conc.: Geol. 1, Math. 18, M.A.E. 114. Rock properties, well-bore hydraulics, air and gas drilling factors affecting penetration rate, slim-hole, lifting capacity liquid, air, or gas, two-phase flow, casing and casing string design, well-bore primary and squeeze cementing, vertical and directional drilling, minimum cost drilling. 3 hr. lec.

211. *Production Engineering.* I, II. 3 hr. PR: Pet.E. 210. Well completion, performance of productive formulation, drill stem tests, completion of wells, flowing wells, gas lift methods and equipment, pumping installation design, well stimulation, emulsion, treating, gathering and storage of oil and gas, field automation. 3 hr. lec.

212. *Drilling Fluids Laboratory.* I. 2 hr. PR or Conc.: Pet.E. 210, Chem. 141, M.A.E. 114. Drilling fluids control relative to pilot testing, drilling fluid design procedures and measurement of composition and properties. 1 hr. lec., 3 hr. lab.

215. *Transport Phenomena in Petroleum Engineering.* II. 3 hr. Introduction to fluid flow in pipes, two-phase flow, rotary drilling hydraulics, primary cementing jobs, flow calculations, flow measuring devices, fluid machinery, dimensional analysis, and heat transfer.

216. *Petroleum Engineering Design.* II. 3 hr. PR: Pet.E. 234. Comprehensive problems in design involving systems in oil and gas production, field processing, transportation, and storage. Three 3-hr. labs.

224. *Petroleum Engineering Problems.* I, II, S. 3 hr. PR: Senior standing. Investigation and detailed report on a special problem in petroleum engineering. Supervised by a member of the Petroleum Engineering faculty. A final oral examination is required.

233. *Elements of Petroleum Reservoir Engineering.* I, II. 3 hr. PR: Pet.E. 236. Basic properties of petroleum reservoir rocks. Fluid flow through porous materials. Evaluation of oil and gas reserves. 3 hr. lec.

234. *Applied Petroleum Reservoir Engineering.* I. 3 hr. PR: Pet.E. 233. Application of reservoir engineering data to calculation of recovery potentials and to analysis, simulation and prediction of reservoir performance under a variety of production methods to effect maximum conservation. 3 hr. lec.

235. *Formation Evaluation.* I, II. 3 hr. PR: Math. 17, Pet.E. 210 or consent. Various well logging methods and related calculations with exercises in interpretation of data from actual well logs. 2 hr. lec., 3 hr. lab.

236. *Mechanics of Hydrocarbon Fluids.* I, II. 3 hr. PR or Conc.: Chem. 141. Qualitative and quantitative phase behavior of single and multicomponent hydrocarbon systems with emphasis on application to petroleum production engineering and petroleum reservoir engineering. 2 hr. lec., 3 hr. lab.

241. *Oil and Gas Property Evaluation.* I. 3 hr. PR: Pet.E. 211, 234, 235. Petroleum property evaluation. Calculation of reserves and future reservoir performance, decline curves, production and formation testing, pressure transient analysis, reservoir test limit, analysis of data, curve fitting, evaluation of processing facilities, and analysis of profitability. 3 hr. lec.

244. *Petroleum Reservoir Engineering Laboratory.* II. 1 hr. PR or Conc.: Pet.E. 233. Laboratory evaluation of basic and special petroleum reservoir rock properties. 3 hr. lab.

262. *Introduction to Reservoir Simulation.* I. 3 hr. PR: I.E. 281, Pet.E. 233, 236. Partial differential equations for fluid flow in porous media and the use of finite-difference equations in solving reservoir flow problems for various boundary conditions. Study of individual well pressures and fundamentals of history matching.

300. *Hydrocarbon Production From Carbonate Rocks.* II. 3 hr. PR: Pet.E. 233, 235. Theory of the production of oil and gas from carbonate rocks, definition and classification of pore geometry, fluid flow characteristics, performance of carbonate rock reservoirs and simulation of these reservoirs. 3 hr. lec.

301. *Advanced Petroleum and Natural Gas Engineering Design.* I, II. (Credit arranged.) PR: Graduate or senior standing. Advanced detail design problems in some phases of petroleum and natural gas exploration, production, and transportation, particularly incorporating new ideas, machines, and methods.

302. *Fluid Flow in Porous Media.* I. 3 hr. PR: Pet.E. 234, Math. 18 or consent. Theoretical and practical aspects of the physical principles of hydrodynamics in porous media. 3 hr. lec.

340. *Secondary Recovery of Oil by Water Flooding.* I. 3 hr. PR: Pet.E. 233. Theory of immiscible fluid displacement mechanism, evaluation and economics of water flood projects, and oil field flooding techniques. 3 hr. lec.

342. *Well Stimulation by Hydraulic Fracturing.* I. 3 hr. PR: Pet.E. 210, 233. Hydraulic fracturing fluids. Parameters involved in fracturing. Fracture initiation, orientation, and extension. Productivity increase after fracturing. Propping agents and general fracturing treatment design. Optimization of fracturing cost. 3 hr. lec.

343. *Advanced Secondary Recovery.* II. 3 hr. PR: Pet.E. 340. Secondary recovery of oil by gas flooding, miscible fluid injection, *in situ* combustion, and heat injection. 3 hr. lec.

362. *Reservoir Simulation and Modeling.* II. 3 hr. PR: Pet.E. 262 or consent. Application of finite-difference equations to multi-phase fluid flow in porous media in two or three dimensions with gravity and capillary pressure effects. Simulation of waterflood performance and enhanced recovery techniques.

384. *Pressure Transient Analysis.* II. 3 hr. PR: Pet.E. 233, 236. Methods of analysis of pressure transient data obtained from well testing for the purpose of determining *in-situ* reservoir conditions including porosity, lateral extent, average reservoir pressure, and formation permeability.

394. *Special Topics.* I, II. 1-6 hr. PR: Consent. Selected fields of study in petroleum and natural gas engineering.

Mineral Processing Engineering (M.P.E.)

M.P.E. Courses of Instruction

217. *Coal Preparation.* I, II. 3 hr. PR: Math. 16, Chem. 16. Formation of coal, rank classification of coal, coal petrography, principles of preparing and beneficiating coal for market with laboratory devoted to sampling, screen analysis, float and sink separation, and use of various types of coal cleaning equipment. 2 hr. lec., 3 hr. lab.

218. *Advanced Mineral Processing.* II. 4 hr. PR: Math. 17 or consent. Application of particle characterization, particle behavior in fluids, industrial sizing, and size reduction fluid-solid separations are discussed. Introduction to froth flotation, and magnetic and electrostatic separation for the concentration of minerals is described. 3 hr. lec., 1 hr. lab.

219. *Surface and Interfaces*. I. 3 hr. PR: M.P.E. 218. Surface tension phenomena, surface thermodynamics, electrical double layer polarized and nonpolarized electrodes, insoluble monolayers, adsorption phenomena, and colloidal foams and emulsion consideration as applied to mineral surfaces.

220. *Mineral Flotation*. I. 4 hr. PR or Conc.: M.P.E. 219. The application of surface phenomena for the beneficiation of minerals, including naturally hydrophobic, insoluble oxides, and semi-soluble and soluble minerals. Activation and depression of sulfide minerals. Engineering and design of flotation circuits. 3 hr. lec., 1 hr. lab.

221. *Hydrometallurgy*. I. 4 hr. PR: Chem. 141, 142; Conc.: M.A.E. 140. Electrochemical aspects and rates of solid-liquid reactions as applied to leaching, concentration and recovery of minerals. Solvent extraction, ion exchange, electrowinning, and other current industrial processes.

222. *Rate Phenomena in Extractive Metallurgy*. II. 3 hr. PR or Conc.: M.A.E. 114, Chem. 141, 142. Momentum heat and mass transfer phenomena theory, concepts of boundary layers and techniques of process analysis as applied to metallurgical reaction systems. 3 hr. lec.

224. *Mineral Problems*. I, II. 1-6 hr. PR: Senior or graduate standing or consent. Special problems considered in minerals beneficiation and processing, including choices among design and research projects in coal preparation, coal conversion, (process) hydro- and extractive metallurgy or minerals economy.

250. *Control Systems in Mineral Processing*. II. 3 hr. PR: Junior standing in mineral processing engineering. Instrumentation and automatic control systems used in today's mineral processing technology are studied including data recording and control and process optimization. 3 hr. lec.

270. *Design and Synthesis*. I. 3 hr. PR: M.P.E. 217, I.E. 281. The logic and quantitative tools required for synthesizing mineral processing systems are used on a realistic problem by students working independently. Specific attention given to economic and environmental implications. 3 hr. lec.

M.E.R. Courses of Instruction

310. *Advanced Hydrometallurgy*. I. 3 hr. M.P.E. 221 or consent. Advanced concepts of hydrometallurgy. Recent technology of leaching, concentration, recovery of metal and mineral values, various mechanisms of leaching of minerals. Techniques such as continuous ion exchange, thermal precipitation and current electrolytic technology.

317. *Advanced Coal Preparation*. II. 3 hr. PR: M.P.E. 217 or consent. The origin and distribution of mineral matter in coal including specific gravity distributions. Fine grinding and beneficiation by flotation technology. Coke blending, solid waste disposal, and advanced plant design.

318. *Advanced Mineral Processing*. II. 3 hr. PR: M.P.E. 219, 220, or consent. Advanced surface phenomena techniques including rigorous treatment of electrokinetic measurements and applications. Advanced concepts of collector adsorption on minerals and flotation response. Recent developments in solvent extraction and cementation including solution.

320. *Modeling of Mineral Extraction Processes*. I. 5 hr. PR: Consent. Theory of particle size distribution functions and population balance models, size reduction kinetics and interphase transfer kinetics and application to the separation of dissimilar solids by physical and chemical methods.

324. *Advanced Special Topics*. I and II. 1-6 hr. PR: Consent. Special advanced problems in mineral process engineering including choices among topics related to coal preparation, conversion, and process metallurgy.

Mineral Resource Economics (M.E.R.)

97. *Energy Resource Economics.* I, II. 3 hr. Dilemmas posed for developing and modern societies by rising energy demands amid concerns for the world's environment. Economics of fuel sources and technologies, and historical and new concerns over resource scarcities.

98. *National Energy Policy.* II. 3 hr. Resource and energy policy problems on a national level, including mineral import quotas, prorationing, federal tax and land-law policy, leasing, mineral research and education, health, and social concerns.

101. *Principles of Resource and Energy Economics.* II. 3 hr. PR: Econ. 54 or consent. Analyzes background for problems important or peculiar to mineral industry economics: exhaustion, externalities, commodity trading, conservation, and the special role of minerals in development and international trade. The analyses of monopoly regulation, antitrust action, and resource planning are presented, and projections made for energy, major metals, and industrial minerals. 3 hr. lec.

200. *Mineral Resource Conservation.* I. 3 hr. PR: Junior standing. The economics of conservation for nonrenewable resources; traditional and modern views; new environmental concerns; problems of regulation. An introduction to cost benefit analysis and to national energy and mineral policy.

210. *The Economics of the Mineral Industries.* I. 3 hr. Analyzes for the nonfuels resources availabilities, market structure, characteristics, and long-run demands. Regional impacts are considered as these relate to national mineral policies and environmental controls. 3 hr. lec.

222. *Energy Economics.* II. 3 hr. Analyzes energy sector of the economy, inter-fuel competition, current and future markets, and international trade. New energy technologies. 3 hr. lec.

300. *Minerals Technology Forecasting.* I, II. 3 hr. PR: Consent. Introduction and review of techniques used for forecasting materials technology. Detailed basic principles. Intended for users and evaluators of these techniques.

301. *Minerals Technology Assessment.* I, II. 3 hr. PR: Consent. Introduction and review of methods applied to the systematic study of the effects on society that may occur when minerals technology is introduced, extended, or modified.

350. *Readings in Mineral Resource and Energy Economics.* I. 3 hr. Review of current mineral economic studies. Selected authors in mineral science and engineering, the economics of natural resource exploitation and environmental control, national mineral policy, world mineral development and trade. 1 hr. lec. and independent study.

351. *Mineral Resource Appraisal and Exploration Decisions.* II. 3 hr. Introduces appraisal techniques for mineral resources including spatial models of occurrence and geostatistical models. Relation of changes in infrastructure and market demands to the value of regional resources. 3 hr. lec.

355. *Advanced Regional Energy Economics 1.* I. 3 hr. Advanced location theory; development of regional income and product accounts. Construction of regional and interregional input-output, dynamic and other models. Application to a variety of regional and interregional energy and resource problems.

359. *Advanced Regional Energy Economics 2.* II. 3 hr. Regional and interregional growth theory. Impacts of changing energy and resource prices on regional and interregional economic development. Regional economic development policy in the United States and selected foreign countries.

381. *Theory and Policy of Mineral Economics.* II. 3 hr. Defines the pure theory of resources and energy allocation with technologic, geologic, and environmental constraints. A general model is presented with partial and special applications for major problem areas: resource valuation, conservation, exhaustion, taxation, and trade. Problems of imperfect competition and monopoly open consideration to the foundations of policy in practice and theory. 3 hr. lec.

392. *The Economics of the Energy and Petrochemical Sectors.* I. 3 hr. PR: Consent. Energy and petrochemical complexes are defined within an open activity analysis model. The problems explored include forecasting energy demands, joint production and costing, environmental controls, and impacts on regional and international trade. 3 hr. lec.

394. *Special Topics in Mineral Economics.* I, II. 3 hr. PR: Consent. Selected economic problems in petroleum and natural gas engineering and the mineral industries. 3 hr. lec.

398. *Models of Mineral Commodity Markets and Industries.* II. 3 hr. Econometric studies analyzing the behavior and problems of selected mineral industries and commodities from the viewpoint of the firm, industry, and region of interest. Applications include programming techniques. 3 hr. lec.

Multidisciplinary Studies

Multidisciplinary Studies (MDS) courses are those which: (a) analyze significant issues, problems, or themes by applying two or more disciplines to them; or (b) explore the theoretical and methodological relationship of two or more disciplines to each other; and (c) involve a combination of disciplines so as to preclude their being classified realistically as one of humanities, social science, or physical science.

Responsibility for approving MDS courses rests with the Core Curriculum Committee and the University Senate. Each course has its own staff, drawn from the faculties of the colleges and schools of the University.

MDS courses may be credited to University Core, as indicated.

Only one Multidisciplinary Studies course may be counted toward fulfilling Core requirements in each Core area.

Multidisciplinary Studies (MDS)

2. *Genetics, Society and Human Affairs.* II. 3 hr. *(May be credited to University Core B or C.)* Origin of life, selection, mutation, eugenics, genetic engineering, genetics and evolution, genetics and medicine, genetics and politics, decision making, social and ethical issues in human genetics. For students interested in heredity and heritage.

40. *Introduction to Women's Studies.* I, II. 3 hr. *(May be credited to University Core A or B.)* The major contexts in which woman's identity has been and is being defined and to the relationships between these definitions and the roles and history of women (and men) in society and culture.

50. *Introduction to Gerontology.* I, II. 3 hr. PR: Sophomore standing. *(May be credited to University Core B.)* Introduction to biological, psychological, and sociological processes and problems associated with human aging, with attention to selected social policies.

60. *Human Sexuality*. I, II. 3 hr. *(May be credited to University Core B or C.)* A study of the biological, behavioral, and societal aspects of sexuality. Issues considered include: changing fecundity; socio-legal implications; sex roles; veneral disease; populations; erotica; aging; dysfunctions; decision-making skills for sex-related issues.

70. *The Human Environment*. I. 3 hr. *(May be credited to University Core B or C.)* An examination of some of the facets of the environment which most directly affect human welfare. Central focus on environmental deterioration and corrective public policies. An interdisciplinary, non-prerequisite course for all students in the University.

80. *Special Topics*. I, II. 1-3 hr.

90. *Man and Food*. I, II. 3 hr. *(May be credited to University Core A or B or C.)* Exploration on a global basis of interactions of man and environment as reflected in food production systems. Relation of food supply and use to development or maintenance of social and political institutions.

91. *Introduction to Technology and Society 1*. I or II. 3 hr. *(May be credited to University Core A or B or C.)* A team-taught introduction to technology (its nature and goals) and society (its nature and goals) in the Victorian era.

92. *Introduction to Technology and Society 2*. I or II. 3 hr. PR: MDS 91. *(May be credited to University Core A or B or C.)* Continuation of MDS 91. *(Course will not be offered in 1983-84.)*

250. *Issues in Gerontology*. I, II. 3 hr. PR: Consent. *(May be credited to University Core B.)* Analysis of societal aspects of aging and exploration of current issues in gerontology. Relating of gerontological concepts to previous course work and field experience.

School of Nursing

Admission

To qualify for admission to the School of Nursing basic program a candidate must have completed one year of prescribed courses in an accredited college or university. Applicants are eligible for review by the Admissions Committee after completion of one full semester of course work in an accredited college or university. The prescribed courses include subjects such as: Chemistry, 8 hours; English Composition, 6 hours; Sociology, 3 hours; Psychology, 3 hours; Nutrition, 3 hours; Life-Span/Growth and Development, 3 hours; Core subjects, Biology, 4 hours, and/or electives.

A dominant factor in the number of students admitted is the limitation of space. Currently, the maximum number of basic students that can be accommodated is 72. *Since West Virginia University is a state university, and since the number of qualified applicants exceeds the number which can be accommodated, primary consideration is given to applicants from West Virginia.* However, up to 10 percent of those admitted to each class may be from out of state.

Application forms for the School of Nursing are distributed by the Office of Admissions and Records at the Medical Center after December 1. Application for admission to the School of Nursing must be made by February 15 of the year the candidate wishes to be admitted. The application may be presented in person or mailed directly to the Assistant to the Dean of Admissions and Records, West Virginia Medical Center, Morgantown, WV

26506. An application fee of $10.00, payable to West Virginia University, must accompany the completed application. The deadline for receipt of transcripts and other required materials is February 15.

The applicant's academic record is the major factor in the decision on admission. The West Virginia resident must have a grade-point average of 2.5, or above, on a scale of 0.0 to 4.0, to qualify for consideration. West Virginia applicants whose grade-point average falls between 2.3 and 2.5 may petition in writing to the Admissions Committee for special consideration. Out-of-state residents with a grade-point average between 3.0 and 3.2 also may petition. Such a petition must be submitted along with the application and must clearly state why the applicant should receive special consideration.

The review of applicants takes approximately two months. The students are notified by mail after review of all applicants is completed. Two weeks after receipt of the letter of acceptance, the student must send a letter stating acceptance of the position to the Assistant to the Dean of Admissions and Records, WVU Medical Center, Morgantown, WV 26506. A $50.00 advance deposit must accompany the letter. This deposit is applied toward the registration fees for the first semester. The deposit is nonrefundable should the student decide not to enter after formally accepting a place in the class.

Transfer Students

A student from an accredited college or university is eligible for admission by presenting a record of courses comparable to those required in this curriculum. Applications for transfer students should be initiated by January 1. Deadline for receipt of transcripts or other required materials is February 15. Apply to: Assistant to the Dean of Admissions and Records, WVU Medical Center, Morgantown, WV 26506.

Registered Nurse Students

The School of Nursing offers graduates of diploma and associate degree nursing programs the opportunity to complete requirements for the baccalaureate degree in nursing at the Morgantown campus, at the Charleston Division of the WVU Medical Center, and by extension at Shepherdstown, Parkersburg, and Beckley. General education credits earned in any accredited college or university may be applied toward the fulfillment of the degree requirements, if the course work is comparable.

Registered Nurse applicants are admitted directly to the School of Nursing. Acceptance and placement in the program is dependent upon the individual's academic record and upon the number of spaces available in the program. The license to practice nursing and a grade-point average of 2.5, or better, are required. Registered Nurses whose grade-point average falls below 2.5 may petition in writing to the Committee on Admissions for special consideration.

About 30 hours of general education courses that meet the WVU Core Curriculum and School of Nursing requirements are recommended before enrollment in the first nursing course. Courses from the following are appropriate: English 1 and 2, 6 hours; Chemistry, 6-8 hours; Introductory Psychology, 3 hours; Introductory Sociology, 3 hours; Anatomy, 3-4 hours; Physiology, 3-4 hours; Microbiology, 3-4 hours; Pharmacology and Toxiology, 3-4 hours; Nutrition, 3 hours; Biology 3-4 hours. Additional Core A, B, or elective credit is advised before enrolling in Nursing 99. The second semester of chemistry may be waived if the applicant has successfully

completed comparable laboratory science courses and meets other science requirements (anatomy, biology, physiology, microbiology, and pharmacology and toxicology). Additional courses may be advised on the judgment of the adviser upon review of the student's background.

All registered nurse students are required to enroll in Nursing 99 (Basic Concepts of Professional Nursing). The purpose of this course is to facilitate transition to the baccalaureate curriculum, to assist students with identified learning needs relevant to the curriculum, and to diagnose the students' readiness for advanced placement in junior-level courses.

Graduates of associate degree programs establish lower-division nursing credit by the transfer of hours. Graduates of diploma programs establish lower-division credit by comprehensive challenge examination of sophomore nursing courses.

Upon successful completion of Nursing 99, and the establishment of lower-division credit, the registered nurse student is eligible for the advanced placement experience. This experience is a conceptual approach to the challenge of junior courses. During this experience a diagnostic and prescriptive analysis of the learning needs of the individual student is made. This diagnosis forms the basis for progression through the remainder of the nursing curricula. Enrollment in junior or senior courses and/or special prescriptive work may follow the advanced placement experience. All prerequisites must be met before advancement into senior nursing courses. The senior courses must be taken by enrollment.

Credit for all required nursing courses must be established by enrollment or by advanced placement.

Upon receipt of a letter of acceptance into the program, the student must contact his/her adviser to establish a progression plan. Six weeks before beginning Nursing 99, the student must notify the Office of Admissions and Records that he/she will be beginning the nursing courses.

Requests for application forms for the Morgantown campus and extension sites should be addressed to the Assistant to the Dean of Admissions and Records, WVU Medical Center, Morgantown, WV 26506.

Application forms for the program at Charleston may be obtained from the Student Affairs Coordinator, Charleston Division, WVU Medical Center, 3110 MacCorkle Ave., S.E., Charleston, WV 25304.

Further information may be obtained from Chairperson, Sophomore Academic Unit, School of Nursing, WVU Medical Center, Morgantown, WV 26506, or Chairperson, Charleston Academic Unit, School of Nursing, Room 2017, WVU Medical Education Building, 3110 MacCorkle Ave., S.E., Charleston, WV 25304.

Curriculum and Courses

For complete information concerning curriculum and courses of instruction in the School of Nursing, see the *WVU Medical Center Catalog*.

School of Pharmacy

Pharmacy was first offered at West Virginia University as a department in the School of Medicine, beginning in 1914. It was changed to the College of Pharmacy in 1936 and to the School of Pharmacy in 1958.

In 1960, the School of Pharmacy changed from a four-year to a five-year program, including two years of pre-pharmacy. The pharmacy curriculum consists of three years of professional study preceded by a minimum of two years of study in an accredited college of arts and sciences.

The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. The council is composed of members from American Pharmaceutical Association, National Association of Boards of Pharmacy, American Association of Colleges of Pharmacy, and American Council on Education.

The School of Pharmacy holds membership in the American Association of Colleges of Pharmacy whose objective is to promote the interests of pharmaceutical education. All institutional members must maintain certain requirements for entrance and graduation.

Admission

All students seeking enrollment in the School of Pharmacy must comply with regulations appearing in the *WVU Undergraduate Catalog* and the *WVU Medical Center Catalog*.

Students preparing for the study of pharmacy may satisfy the course work requirements for entrance into the School of Pharmacy by majoring in any arts and sciences subject and including in their course selection the following, or their equivalents:

English Composition	6 hr.	Chemistry, General	8 hr.
College Algebra	3 hr.	Chemistry, Organic	8 hr.
Trigonometry	3 hr.	Physics	8 hr.
Principles of Economics	6 hr.	Electives (Core A & B)	18 hr.
Biology, General	8 hr.		
		TOTAL	68 hr.

Electives must be chosen to satisfy University Core Curriculum requirements.

Because limited openings are available, preference in admissions is given to qualified West Virginians although outstanding nonresident applicants will be considered. Careful consideration is given to those personal qualifications which bear upon fitness of applicants for the study and practice of the profession.

Admissions are competitive and are based on the cumulative academic average and science average achieved in all prior college courses, a personal interview, recommendations, and the results of the Pharmacy College Admission Test (PCAT.)

For admission to the School of Pharmacy, formal application should be made to the Committee on Admissions of the School of Pharmacy as early as possible after January 1, but by April 1, preceding the fall term (first semester) in which the student is seeking enrollment. Formal applications received after the April 1 deadline will be considered only when vacancies exist.

Applicants should write to the Office of Admissions and Records, WVU Medical Center, Morgantown, WV 26506, which will furnish official blanks on which formal application must be made. A $10.00 application fee is required and must accompany the application.

Each applicant recommended for acceptance is expected to deposit $50.00 before the applicant's name is entered upon the official list of those accepted by the School of Pharmacy. If the applicant enrolls, this sum is applied to the first-semester tuition. If the applicant fails to enroll, this deposit is forfeited.

It is required that during the first semester of the first year all students must complete certain prescribed immunization and diagnostic procedures.

Complete information may be obtained from the Dean of the School of Pharmacy, or from the Office of Admissions and Records, WVU Medical Center, Morgantown, WV 26506.

Pharmacy College Admission Test

Completion of the Pharmacy College Admission Test is a requirement for admission. It is strongly recommended that the student take the test in the fall before making application for admission. Information concerning time and place of the test can be obtained from a pre-pharmacy adviser, or by writing: Pharmacy College Admission Test, The Psychological Corporation, 304 East 45th St., New York, NY 10017.

Personal Interview

A personal interview with the Committee on Admissions is required. Interviews are held at the WVU Medical Center and are arranged as far as possible to suit the convenience of the applicant. Interviews are scheduled during February, March, and April. Only applicants with a cumulative and science grade-point average of 2.5 or above will be called for an interview, unless openings are available.

Admission to Advanced Standing

If space is available, students from other accredited schools of pharmacy may be admitted, provided they meet the course requirements of the WVU School of Pharmacy, have a 2.5 grade-point average, and are eligible for readmission for the degree in pharmacy in the school previously attended. D grades in professional courses will not be transferred.

Curriculum and Courses

For complete information concerning the curriculum and courses of instruction in the School of Pharmacy, see the *WVU Medical Center Catalog.*

School of Physical Education

The School of Physical Education is organized into four departments: (1) the Department of Professional Physical Education; (2) the Department of Sport and Exercise Studies; (3) the Department of Safety Studies; and (4) the Department of General Physical Education.

Professional students (physical education teaching majors or sport and exercise studies majors) examine the relationship of play, games, sport, athletics, and dance to our culture and cultures throughout the world. Their preparation includes the acquisition of knowledge and skills from a vast array of movement activities in addition to an understanding of associated physiological, biomechanical, sociological, psychological, historical, philosophical, and pedogogical principles. Students in safety develop competencies which enable them to use innovative approaches in the conduct

of safety and driver instructional activities. Their preparation is designed to develop foundation skills and knowledge related to accident prevention.

Graduates (Professional Physical Education) with teaching and/or athletic training coaching certification are generally employed as elementary or secondary physical education teachers and athletic coaches/trainers. Graduates (Sport and Exercise Studies) complete nonteaching curricula and are employed at such community agencies as YMCAs and YWCAs, private sport enterprises, health spas, fitness centers, community or industrial recreation projects, private and public camps, sporting goods stores, commercial sporting goods manufacturers, professional and collegiate athletic promotion and administration; others are employed as sport writers or sport broadcasters. Graduates (Safety Studies) with teacher certification are generally employed as driver and traffic and emergency care teachers, and others are employed as safety specialists in business and industry.

Baccalaureate degree programs offered in the School of Physical Education are: (1) teacher certification in the Professional Physical Education program with a second teaching field chosen from many curricula; and (2) Sport and Exercise Study programs with a chosen emphasis from sport management, sport marketing, sport writing, sport broadcasting, sport physiology, and sport behavior (psychology/sociology). Certification is available in: (1) athletic training as a second teaching field; (2) athletic coaching; (3) dance; and (4) safety education as a second teaching field. Students completing safety education as a second teaching field are primarily employed as driver education teachers.

Degrees at both the masters and doctoral levels are offered in Professional Physical Education, Sport and Exercise Studies, and Safety Studies. For more information about these degrees and programs, consult the *WVU Graduate Catalog*.

Facilities

Facilities of the School of Physical Education include the gymnasium, dance studio, and swimming pool in Moore Hall; gymnasiums in Stansbury Hall; bowling lanes and game rooms in Mountainlair; indoor track, tennis courts, weight training room, and rifle range in the Shell Building; outdoor areas including the stadium, tennis courts, archery range, soccer and field hockey fields; and the Natatorium.

The Coliseum contains the Ray O. Duncan Memorial Library, classrooms and seminar rooms, a large gymnasium, a dance studio, handball and squash courts, safety studies laboratories, human factors research laboratories, and faculty offices. (Some faculty and staff offices are in Moore Hall, Stansbury Hall, the Natatorium, and the Shell Building.)

Faculty

William L. Alsop, Ed.D. (WVU), *Associate Professor of Physical Education; Chairperson, Sport and Exercise Studies.*

Carl P. Bahneman, Ph.D. (U. Pitt), *Professor of Physical Education; Chairperson, Professional Physical Education.*

Kittie J. Blakemore, M.S. (WVU), *Associate Professor of Physical Education; Basketball Coach.*

William A. Bonsall, M.S. (WVU), *Associate Professor Emeritus of Physical Education.*

Marilyn Kay Bowers, M.S. (Ind. St. U.), *Instructor in Physical Education.*

John W. Brautigam, M.S. (U. Ariz.), *Instructor in Physical Education; Athletic Trainer.*

Dana D. Brooks, Ed.D. (WVU), *Assistant Professor of Physical Education.*

Linda K. Burdette, M.S. (WVU), *Assistant Professor of Physical Education; Gymnastics Coach.*

Wincie Ann Carruth, Ph.D. (NYU), *Professor Emerita of Physical Education.*
Linda M. Carson, Ed.D. (WVU), *Assistant Professor of Physical Education.*
W. Gale Catlett, B.S. (WVU), *Lecturer in Physical Education; Head Basketball Coach.*
E. Eugene Corum, M.S. (WVU), *Associate Professor of Physical Education; Assistant Dean.*
Daniel E. Della-Giustina, Ph.D. (Mich. St. U.), *Professor and Chairperson of Safety Studies.*
Margaret T. Devaney, M.F.A. (U. N.C.), *Instructor in Physical Education.*
J. William Douglas, Ph.D. (Ohio St. U.), *Professor of Physical Education; Dean.*
Edward F. Etzel, Jr., M.S. (WVU), *Lecturer in Physical Education; Rifle Coach.*
Patricia K. Fehl, Ed.D. (Ind. U.), *Professor of Physical Education; Chairperson, General Physical Education.*
William Finamore, M.S. (WVU), *Lecturer in Safety Studies.*
Kevin H. Gilson, Ed.D. (WVU), *Associate Professor of Physical Education; Swimming Coach.*
Veronica A. Hammersmith, M.A. (U. Kans.), *Lecturer in Physical Education; Volleyball Coach.*
Stephen Harrick, M.A. (WVU), *Associate Professor Emeritus of Physical Education.*
Andrew H. Hawkins, Ph.D. (Ohio St. U.), *Assistant Professor of Physical Education.*
Beatrice Hurst, M.A. (Columbia U.), *Associate Professor Emerita of Physical Education.*
Linda S. King, Ed.D. (WVU), *Assistant Professor of Physical Education; Track and Field Coach and Cross Country Coach.*
Robert L. Kurucz, Ph.D. (Ohio St. U.), *Professor of Physical Education.*
John C. McGrath, M.S. (Bemidji St. C.), *Assistant Professor of Physical Education; Soccer Coach.*
Gary D. McPherson, M.Ed. (WVU), *Lecturer in Physical Education; Associate Basketball Coach.*
C. Everett Marcum, H.S.D. (Ind. U.), *Professor of Safety Studies.*
George A. Nedeff, M.S. (WVU), *Adjunct Assistant Professor of Physical Education.*
Don Nehlen, M.S. (Kent St. U.), *Lecturer in Physical Education; Head Football Coach.*
Andrew C. Ostrow, Ph.D. (U. Calif.), *Associate Professor of Physical Education.*
Gregory Ott, M.S. (U. Ariz.), *Instructor in Physical Education; Athletic Trainer.*
Mary Jane Pearse, M.S. (WVU), *Associate Professor Emerita of Physical Education.*
Martin Pushkin, Ed.D. (WVU), *Instructor in Physical Education; Track and Field and Cross Country Coach.*
I. Dale Ramsburg, Ed.D. (WVU), *Assistant Professor of Physical Education; Baseball Coach.*
Fred A. Schaus, M.S. (WVU), *Adjunct Associate Professor of Physical Education; Director of Intercollegiate Athletics.*
John Semon, M.S. (WVU), *Associate Professor Emeritus of Physical Education.*
Pete Shaffron, Jr., Ed.D. (WVU), *Assistant Professor of Safety Studies.*
Bobby Joe Smith, B.S. (WVU), *Lecturer in Physical Education; Assistant Basketball Coach.*
Andrew J. Sorine, Ed.D. (WVU), *Assistant Professor of Safety Studies.*
John C. Spiker, M.Ed. (U. Pitt), *Associate Professor of Physical Education; Athletic Trainer.*
David H. Taylor, M.S. (WVU), *Instructor in Physical Education; Director, Recreation-Intramurals.*
David E. Thompson, M.S. (WVU), *Lecturer in Safety Studies.*
Martha T. Thorn, M.S. (WVU), *Assistant Professor of Physical Education; Tennis Coach.*
Patrick A. Tork, M.S. (WVU), *Professor Emeritus of Physical Education.*
Craig Turnbull, M.S. (WVU), *Lecturer in Physical Education; Wrestling Coach.*
Anthony T. Veltri, M.S. (WVU), *Lecturer in Safety Studies.*
David W. Wanstreet, B.S. (WVU), *Instructor in Physical Education.*
J. Owen Weber, M.B.A. (U. S. Fla.), *Lecturer in Safety Studies.*
Charity W. White, M.S. (WVU), *Associate Professor Emerita of Physical Education.*
Mary Kathryne Wiedebusch, M.A. (WVU), *Associate Professor of Physical Education.*
Robert L. Wiegand, Ed.D. (U. Ga.), *Associate Professor of Physical Education.*
Bruce W. Wilmoth, M.S. (B. Young U.), *Associate Professor of Physical Education.*

Rachel A. Yeater, Ph.D. (WVU), *Associate Professor of Physical Education.*
C. Peter Yost, Ph.D. (U. Pitt), *Professor and Dean Emeritus of Physical Education.*
Daniel H. Ziatz, Ph.D. (U. Utah), *Associate Professor of Physical Education.*

Admission

For admission to the School of Physical Education, prospective students must be qualified for admission to WVU and have a grade-point average of 2.0.

Students will be considered for admission to WVU on the basis of graduation and submission of transcripts from accredited high schools and ACT test results. High school graduates are required to present credit for 4 units of English and 2 units of college preparatory mathematics, 1 of which must be algebra. Applicants with substantial life experience will be considered on an individual basis.

All students entering as first-term freshmen are required to take the American College Testing (ACT) Program test and have the report of scores sent to the University, and no other test may be substituted for it.

Students from West Virginia high schools should obtain applications for admission from their high schools. Out-of-state students may write the WVU Office of Admissions and Records and request an application form. Applicants should prepare their part of the application and return it to their secondary school. The school will send the completed application and a transcript of high school grades directly to the WVU Office of Admissions and Records.

Students interested in financial assistance must file a Financial Aid Form. Forms are available at the high schools or from the WVU Student Financial Aid Office. Students must submit forms dated only for the current academic year.

Credit Load Per Semester

The minimum work per semester is 12 hours and the maximum work per semester is 20 hours. Exceptions to this regulation are:

An adviser may register a student as a part-time student if less than 12 hours are required to meet all requirements for the bachelor's degree.

Other exceptions to these regulations may be requested by petitioning the Committee on Academic Standards.

Requirements for Degrees

1. *University Core Curriculum*—Students in teacher certification programs will complete general studies requirements as listed in the College of Human Resources and Education (Programs for Secondary School Teachers); other students will complete the University Core Curriculum.

2. *Teacher Certification Curriculum*—Students in teacher certification programs must complete a group of educationally related courses, as well as another subject specialization.

3. *Major Requirements*—Students must complete the requirements as determined by the appropriate department.

4. *Total Hours*—Students must complete a minimum of 128 hours.

5. *Grade-Point Average*—A minimum grade-point average of 2.0 is necessary for graduation.

Department of Professional Physical Education

The Department of Professional Physical Education offers opportunities for students to pursue certification in teaching, athletic training, coaching, and dance. Study by students in these areas centers on the motor development process.

Teacher Certification Program in Physical Education

The required courses for teacher certification in physical education are:

1. Theory and Foundations—P.P.E. 67, 75, 121, 126 (K-12 only), 133, 176, and S.E.S. 72, 164, 165.
2. Psychomotor
   a. Team and Individual Sports—Students must complete four of the following:
      P.P.E. 45—Football, Baseball, Softball
      P.P.E. 46—Volleyball, Soccer, Speedball
      P.P.E. 47—Basketball, Field Hockey, Team Handball
      P.P.E. 48—Tennis, Badminton, Golf
      P.P.E. 49—Archery, Bowling, Fencing
      P.P.E. 50—Wrestling, Weight Training, Track and Field
   b. Aquatics—Students must complete one of the following:
      P.P.E. 57—Aquatics
      P.P.E. 59—Synchronized Swimming
      P.P.E. 124—Water Safety Instructorship
   c. Dance—Students must complete one of the following:
      Dance 35—Theory and Practice of Modern Dance Techniques
      Dance 37—Advanced Dance Techniques with Principles of Choreography
      Dance 38—Dance Composition
      Dance 39—Folk and Ballroom Dance
   d. Gymnastics—Students must complete one of the following:
      P.P.E. 65—Gymnastics
      P.P.E. 66—Advanced Gymnastics
   e. Rhythms and Low Organization Games (K-12 only)—
      P.P.E. 109—Early Childhood Activities
      P.P.E. 110—Middle Childhood Activities
3. Second Teaching Field and Professional Education—*(See requirements as listed in the College of Human Resources and Education.)*

Recommendation for Teacher Certification

The prospective teacher who intends to apply for teacher certification in West Virginia must satisfy the requirements: (1) in physical education, professional education, and a second teaching field; (2) in athletic training, first teaching field, and professional education; and (3) in safety education, first teaching field, and professional education.

Teacher certification in physical education is provided for Grades K-12 or 7-12. The second teaching field must be chosen from the many and varied teaching specialization programs for elementary and secondary school teachers listed in the College of Human Resources and Education, program area in Curriculum and Instruction.

Certification in Athletic Training

The required courses for certification in athletic training are:

1. Physical Education—P.P.E. 121, 176, 219, 220, 221, 222, 223, and 324 and S.E.S. 164, 165.
2. Safety Studies—Saf. S. 70.
3. Biology—Biol. 266 or Physi. 141.

In addition, the student will complete a first teaching field and professional education requirements. *(See requirements as listed in College of Human Resources and Education.)*

Certification in Athletic Coaching

The required courses for a WVU athletic coaching certificate are P.P.E. 121, 156, 157, and S.E.S. 72, 164, 165.

This certification program is *not* part of the subject-matter specializations approved by the West Virginia Board of Education.

Certification in Dance

The required courses for a WVU dance certification are Dance 35, 37, 38, 70, 82, 87, plus 4 hours of approved electives, excluding Dance 198.

This certification program is *not* part of the subject-matter specializations approved by the West Virginia Board of Education.

Department of Sport and Exercise Studies

The Department of Sport and Exercise Studies offers opportunities for students to pursue degree programs in Sport Behavior, Sport Management, Sport Broadcasting, Sport Reporting, and Sport Physiology. (The degree programs in Sport and Exercise Studies are nonteacher certification programs.)

The required courses for the Sport and Exercise Studies programs are:

1. Completion of University Core Curriculum.
2. Theory and Foundation:
   P.P.E. 67, 72, 75, 121, 156, 157.
   S.E.S. 164, 165, 197, 198.
3. Psychomotor
   a. Team and Individual Sports—students must complete four of the following (two individual and two team).
      P.P.E. 45—Football, Baseball, Softball
      P.P.E. 46—Volleyball, Soccer, Speedball
      P.P.E. 47—Basketball, Field Hockey, Team Handball
      P.P.E. 48—Tennis, Badminton, Golf
      P.P.E. 49—Archery, Bowling, Fencing
      P.P.E. 50—Wrestling, Weight Training, Track and Field
   b. Aquatics—Students must complete one of the following:
      P.P.E. 57—Aquatics
      P.P.E. 59—Synchronized Swimming
      P.P.E. 124—Water Safety Instructorship
   c. Gymnastics—Students must complete one of the following:
      P.P.E. 65—Gymnastics
      P.P.E. 66—Advanced Gymnastics

4. Second Field—A second field is to be selected from one of the following areas. Course requirements for each area are listed:
   a. Sport Behavior (Psychology and Sociology)—Psych. 1, 2, 141, 151, 6 hours electives—200 level courses. Sociology/Anthropology 1, 5, 102, 122, 6 hours electives—100-level courses.
   b. Sport Management—Acctg. 51 and 52, Econ. 51 and 52, B. Law 111, Manag. 105, Mrktg. 111, Fin. 111. Electives—6 hours chosen from any of the following: accounting, business law, economics, finance, management, and marketing. (Students may substitute Math. 28 as an elective.)
   c. Sport Broadcasting—Journ. 18, 19, 182, 183, 189, 228, 284, 285.
   d. Sport Reporting (Newspaper)—Journ. 18, 19, 111, 118, 120, 141, 220, 228.
   e. Sport Physiology—Biol. 1, 2, Chem. 15, 16, Math. 3, 4, Phys. 1, 2, Physi. 141, 241.

Department of General Physical Education

The aims of the General Physical Education Program are to develop: (1) an appreciation of the body and its capacity to move; (2) movement skills within the concept of games, sport, dance, and aquatics; (3) an appreciation of the value of continued activity throughout all age periods in an individual's life; (4) an understanding of the cultural significance of sport and dance; and (5) concepts of the physiological characteristics of sport and movement.

General Physical Education classes are open to all students of the University. A wide variety of sport, aquatic, dance, gymnastic, fitness, martial arts, outdoor adventure and lifetime sport activities are offered. Courses numbered G.P.E. 1-42 or Dance 4-20 are those available for election by students. Elementary education majors must enroll in G.P.E. 41 and 42. All courses are at a beginning level unless otherwise specified. Repeating an activity is not allowed except at a more advanced level.

The University Health Service will determine whether students are physically qualified to participate in the General Physical Education Program. An individually adapted program, based on the recommendations of the health service, is offered to the student who is unable to participate in the regular program because of physical handicap.

Department of Safety Studies

Teacher Certification in Safety Education

The required courses for teacher certification in Safety Education are: Saf. S. 70, 131, 151, 232, 254, 256.

In addition, the student will complete a first teaching field and professional education requirements. *(See requirements as listed by the College of Human Resources and Education.)*

Courses of Instruction

Dance (Dance)

4. *Beginning Ballet.* I, II, S. 1 hr. Simple ballet techniques, positions, basic barre work, and movements of dancing.

5. *Ballroom Dance.* I, II. 1 hr.

6. *Elementary Jazz Dance.* I, II, S. 1 hr. Expressions of feelings through body movement to the jazz dance rhythms.

7. *Intermediate Jazz Dance.* I, II. 1 hr. PR: Dance 6 or consent. Further development of jazz technique and appreciation of jazz as an American art form.

8. *Beginning Tap Dance.* I, II, S. 1 hr. Simple tap skills, study of basic tap rhythms and fundamentals.

11. *Folk Dance.* I, II. 1 hr.

17. *Elementary Modern Dance.* I, II. 1 hr.

19. *Intermediate Modern Dance.* I, II, S. 1 hr. PR: Dance 17 or 35 or consent. An extended study of modern techniques in dance developing form, control, and style.

20. *Advanced Modern Dance.* I, II. 1 hr. PR: Consent.

35. *Theory and Practice of Modern Dance Techniques.* I, II. 2 hr. Modern dance techniques and rhythmic analysis of movement patterns.

37. *Advanced Dance Techniques with Principles of Choreography.* II. 2 hr. PR: Dance 35. Concentrated study in creative movement problems.

38. *Dance Composition.* II. 2 hr. PR: Dance 35, 37. Problems in force, time, and space as elements of expressive movement.

39. *Folk and Ballroom Dance.* I, II. 2 hr. Folk, square, and ballroom dance forms.

70. *Elementary Ballet.* I. 2 hr. PR: Dance 4 or consent. Technique of classical theatrical dancing. Includes barre exercises, port de bras, basic adage movements, and center practice in jumping and beginning turns. A thorough theoretical knowledge, as well as technical achievement, is stressed.

71. *Intermediate Ballet.* II. 2 hr. PR: Dance 70 or consent. Technique of classical theatrical dancing. Includes barre exercises, port de bras, adage combinations and center practice in jumping, pirouettes, turns and basic pointe work. Emphasis on correct technical execution, purity of line, and classical style.

73. *Advanced Ballet.* I. 2 hr. PR: Dance 70, 71 or consent. Technique of classical theatrical dancing. Includes barre exercises, port de bras, adage, allegro, tours, and pointe work in complex and varied movement combinations. Theoretical knowledge and teaching fundamentals will also be developed.

75. *Ballet Repertoire.* II. 2 hr. PR: Dance 70, 71, 73 or consent. Study of the standard corps de ballet and solo variations from the classics of the nineteenth and twentieth century ballet repertoire. Also includes contemporary choreography, pointe work, and elementary partnering techniques.

82. *Jazz 1.* I, II. 2 hr. Basic jazz dance fundamentals and techniques; development of coordination, strength, and flexibility through the execution of the elementary jazz warm-ups, movement progressions, and combinations.

83. *Jazz 2.* II. 2 hr. PR: Dance 82 or consent. Continuation of jazz dance techniques and concepts with an emphasis on jazz isolations, polyrhythms, and syncopated movement sequences; continued persistence in the development of the body as an instrument of expression.

85. *Jazz 3.* I. 2 hr. PR: Dance 83 or consent. In-depth exploration of both traditional and contemporary jazz techniques and styles; continues progression towards a more advanced level of technical skill as developed and utilized through this specific dance expression.

87. *Advanced Folk Dance.* II. 2 hr. PR: Dance 39 or equiv. Advanced study of international folk dance. Includes its place in education and as a performing art and an analysis of the cultural and social backgrounds and their effect of international dance.

88. *Intermediate Modern Technique.* I, II. 2 hr. PR: Dance 17, 18, or combination of Dance 35, 37, 38 or consent. Intensive concentration of technique form, interpretation and artistic sensitivity of performance with kinesthetic awareness.

90. *Advanced Modern Technique and Repertoire.* I. 2 hr. PR: A combination of Dance 35, 37, 38 and 88 or consent. Advanced tutorial technique courses relating advanced theories and individual study in the design of technique, style and compositional form. The study incorporates the allied areas of music, art, and spoken word as stimulating effects.

100. *Theatre Dance 1.* I. 2 hr. Develops a basic practical knowledge of choreographed movement in the musical comedy dance idiom. Fundamentals of ballet for the actor, rhythm and movement, and Broadway dance styles and vocabulary will be studied.

101. *Theatre Dance 2.* II. 2 hr. PR: Dance 100 or consent. Emphasizes study and staging of dance sequences from the musical theatre, building from a foundation of ballet for the actor, and style studies of derivative dance-sources.

102. *Dance Production 1.* I. 2 hr. Lecture and laboratory theories of dance production with creative projects and/or performance in the production of dance. Choreography concepts visualized and developed in the theatricality of composition, costume design, and stage design will be included.

103. *Dance Production 2.* II. 2 hr. PR: Dance 102. An in-depth concentration of dance production as an art form. Choreography concepts fully developed for performance with staging techniques, utilizing the dimensional elements of this space-time-art.

171. *Basic Rhythms and Dance Accompaniment.* II. 2 hr. PR: One semester of modern dance. Basic principles of rhythm as they relate to body movement. *(Ability to play the piano is not required.)*

198. *Special Topics.* I, II, S. 1-3 hr. PR: Consent of department chairperson. Designed to permit in-depth study of theatrical dance forms and production through an innovative course(s) or research or field experiences not included in the mjaor curriculum but as an adjunct to the curriculum.

General Physical Education (G.P.E.)

1, 2. *General Program.* I, II, S. 1 hr. Courses in the following are offered: Aerobic Dance; Aquatics; Badminton; Billiards; Conditioning; Dance; Figure Improvement; Fitness; Flag Football; Frisbee; Golf; Gymnastics; Handball; Horseback Riding; Ice Skating; Jogging; Martial Arts (Aikido, Karate, Kung Fu, Self Defense, Tai Chi); Orienteering; Paddleball, Racquetball; Riflery; Slow Pitch Softball; Snow Skiing; Soccer; Sports Appreciation; Squash; Table Tennis; Team Handball; Tennis; Trampoline; Tumbling; Volleyball; Water Polo; Weight Training; W.S.I.; Wrestling; and Yoga.

7. *Archery.* I, II. 1 hr.

11. *Beginning Swimming.* I, II, S. 1 hr. Designed for those who do not swim at all or cannot swim a pool length.

12. *Intermediate Swimming.* I, II, S. 1 hr. Designed for those who have minimal skills in swimming and who wish to improve basic strokes.

16. *Advanced Lifesaving.* I, II, S. 1 hr. PR: Swimming skill. Knowledge and skills for aquatic emergencies. American Red Cross Certification.

17. *Diving*. I, II, S. 1 hr. Selected dives from the one-meter and three-meter boards in the five diving categories.

18. *Advanced Swimming*. I, II, S. 1 hr. A course to develop rhythm, polish, effectiveness, and endurance in the nine styles of swimming.

19. *Orientation to Scuba*. I, II, S. 1 hr. PR: Advanced swimming skill. A beginning course for those with advanced swimming skills. Includes skin diving, safety practices, physics of diving, and elementary work with self-contained, underwater breathing apparatus.

20. *Canoeing*. I, II, S. 1 hr. PR: Swimming skill. Types of canoeing strokes, life-saving techniques for recreational canoeing.

22. *Slimnastics*. I, II, S. 1 hr. Exercises, fitness, weight control, and conditioning activities.

23. *Backpacking*. I, II, S. 1 hr. Knowledge of equipment, maps and compass skills, packing techniques and safety procedures. *(Long hikes and overnight campouts are required.)*

24. *Bowling*. I, II, S. 1 hr. Knowledge and techniques of bowling. *(Not for skilled bowlers.)*

25. *Fencing*. I, II. 1 hr.

40. *Early Childhood Activities*. I, II, S. 1 hr. For classroom teachers specializing in programs for pre-school and nursery children. Emphasis on motor growth and development patterns, discrimination of basic perceptual factors, and fundamental movements.

41. *Movement Education and Rhythms*. I, II, S. 1 hr. Basic movement skills, games, and simple rhythms appropriate for young children.

42. *Elementary Sports Skills*. I, II, S. 1 hr. Basic skills and lead-up games for children.

Professional Physical Education (P.P.E.)

43. *Physical Education for Elementary Teachers*. I, II, S. 2 hr. PR: P.P.E. 41, 42, or consent. Philosophy, objectives, curriculum, and methods of teaching physical education activities for children.

45. *Football, Baseball, and Softball*. I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for football, baseball, and softball.

46. *Volleyball, Soccer, and Speedball*. I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for volleyball, soccer, and speedball.

47. *Basketball, Field Hockey, Team Handball*. I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for basketball, field hockey, and team handball.

48. *Tennis, Badminton, and Golf*. I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for tennis, badminton, and golf.

49. *Archery, Bowling, and Fencing*. I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for archery, bowling, and fencing.

50. *Wrestling, Weight Training, and Track and Field*. I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for wrestling, weight training, and track and field.

57. *Aquatics*. I, II. 2 hr. PR: Intermediate swimming. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for aquatics.

59. *Synchronized Swimming*. I, II. 1 hr. PR: P.P.E. 57. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for synchronized swimming.

65. *Gymnastics*. I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for gymnastics.

66. *Advanced Gymnastics*. I, II. 2 hr. PR: P.P.E. 65. Develops cognitive, affective, and psychomotor competencies, and teaching strategies for advanced gymnastics.

67. *Introduction to Physical Education*. I, II, S. 3 hr. Examines the historical and philosophical bases, sport and movement principles, and the major issues and professional practices in physical education, and sport and exercise studies.

68. *Sport Officiating*. II. 2 hr. Study of officiating.

75. *Motor Learning and Development*. I, II. 2 hr. PR: Ed.P. 103 or Psych. 1 or consent. Examines the factors influencing the acquisition of motor skills and how these factors interact with the motor development process.

109. *Early Childhood Activities*. I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies in rhythms and games for children in early childhood.

110. *Middle Childhood Activities*. I, II. 2 hr. Develops cognitive, affective, and psychomotor competencies in rhythms and games for children in middle childhood.

121. *Sport Injury Control and Management*. I, II. 3 hr. Training, conditioning, protection, and other injury prevention measures. First aid, emergency service, and care related to physical education and athletics.

124. *Water Safety Instructorships*. I, II. 2 hr. PR: Senior Lifesaving Certification. Teaching methods in swimming and water safety. Meet American Red Cross certification standards. Course completion carries eligibility for teaching swimming, lifesaving, and water safety.

126. *Implementing Physical Education Programs, K-8*. I, II. 4 hr. PR: P.P.E. 75, 110. Emphasis on conducting physical education in grades K-6.

133. *Physical Education in Grades 7-12*. I, II. 5 hr. PR: Junior standing; four courses in activity sequence; Ed. P. 103 and 105. Emphasis on conducting physical education in grades 7-12.

156. *Principles and Problems of Coaching* I, II, S. 2 hr. PR: Junior standing or consent. Designed to acquaint students with principles and problems of interscholastic athletic coaching.

157. *Techniques of Coaching*. I, II, S. 2 hr. PR: P.P.E. 156 or consent. *(Course may be repeated.)* Designed to permit students to gain athletic coaching experience through a supervised on-site experience with a varsity athletic team. *(Laboratory work included.)*

176. *Adapted Program in Physical Education*. I, II. 2 hr. PR: Junior standing. Organizing and adapting physical education programs to meet the needs of atypical students.

197. *Internship*. I, II, S. 1-12 hr. PR: Senior standing or consent. A student internship in selected agencies, businesses, and schools related to sports. *(Graded Pass/Fail.)*

198. *Special Topics*. I, II, S. 1-3 hr. PR: Consent of department chairperson. In-depth analysis of physical education subject-matter areas through an innovative course or research or field experiences not included in the major curriculum but as an adjunct to the curriculum.

219. *Gross Anatomy*. II. 3 hr. PR: Consent. Designed to provide an overview of body systems and gross anatomy of the trunk and extremities.

220. *Advanced Athletic Training 1*. S. 3 hr. PR: P.P.E. 121, S.E.S. 164, 165, Saf. S. 70 or consent. Designed to provide an in-depth analysis of life-threatening situations in athletics, injury prevention measures, nutrition in athletics, athletic conditioning, and general rehabilitation concepts.

221. *Advanced Athletic Training 2*. I, S. 3 hr. PR: P.P.E. 121, 219, S.E.S. 164, 165, Saf. S. 70 or consent. Designed to investigate tissue repair, physiology of hot and cold treatment, therapeutic modalities and pharmacology relevant to athletic injury management.

222. *Advanced Athletic Training 3*. II, S. 3 hr. PR: P.P.E. 219, 220, 221 or consent. Designed to provide in-depth analysis of athletic injury mechanisms; injury evaluation techniques and rehabilitation; and muscle isolation techniques.

223. *Athletic Training Practicum*. II. 3 hr. PR: Consent. Designed for the practical application of athletic training technqiues.

Safety Studies (Saf. S.)

70. *First Aid and Emergency Care*. I, II, S. 3 hr. Emergency aid for the sick and injured. Emergency services aimed at reducing the potential of permanent disability or threats to life, as well as pain, damage, or suffering of less serious nature.

131. *Accident Prevention and Control Principles*. I, II, S. 3 hr. Basic course which structures principles, concepts, and methodology of the safety movements into introductory experiences dealing with accident prevention and control efforts recommended for various social institutions and agencies.

151. *Driver and Highway Safety Fundamentals*. II, S. 3 hr. PR: Saf. S. 131 or consent. Basic course for individuals who will provide instruction for beginning drivers which emphasize essential content, methods, and desirable practices for both classroom and laboratory applications.

231. *Safety in Motor Transportation Services*. II. 3 hr. PR: Saf. S. 131 or consent. Safety elements of automotive transportation equipment. Design, operation, planning, and control plus effects of legislation. The school motor fleet is highlighted.

232. *Safety Education Principles and Content*. I. 3 hr. PR: Saf. S. 131 or consent. Study and analysis of content areas usually recommended for instructional programs within the field of safety, with emphasis on structured learning experiences.

254. *Teaching Driver and Highway Safety*. S. 3 hr. PR: Saf. S. 151 or equiv. and valid driver license. Teaching and coordinating driver and highway safety education in schools. Arranged laboratory assures practice in providing behind-the-wheel instruction to beginning drivers.

256. *Driver and Safety Instructional Innovations*. II, S. 3 hr. PR or Conc.: Saf. S. 151 and 254. Multimedia, multivehicle, simulation, and other innovations for classroom and laboratory instruction applied to driver and safety education as revealed by research and current literature.

291. *Special Topics*. I, II, S. 2-6 hr. PR: Consent. Consideration of persistent issues and changing problems in the safety field. Seminar emphasis extends considerable attention to safety interests of participating class members.

Sport and Exercise Studies (S.E.S.)

67. *Introduction to Physical Education*. I, II, S. 3 hr. Examines the historical and philosophical bases, sport and movement principles, and the major issues and professional practices in physical education, and sport and exercise studies.

72. *Sociological and Psychological Perspectives of Sport.* I, II. 3 hr. Sociological and psychological factors related to involvement in sport.

164. *Kinesiology.* I, II. 3 hr. PR: Junior standing. Anatomical, mechanical, and musculoskeletal study of the human body as the instrument for efficient performance of motor activities. *(Laboratory work included.)*

165. *Physiology of Motor Activities.* I, II. 3 hr. PR: Junior standing. Human functions under stress of motor activities. *(Laboratory work included.)*

197. *Internship.* I, II, S. 1-12 hr. PR: Senior standing or consent. A student internship in selected agencies, businesses, and schools related to sports. *(Graded Pass/Fail.)*

198. *Special Topics.* I, II, S. 1-3 hr. PR: Consent of department chairperson. In-depth analysis of sport and exercise studies subject-matter areas through an innovative course or research or field experiences not included in the major curriculum but as an adjunct to the curriculum.

225. *Program Planning of Recreational Sport.* I, II, S. 3 hr. PR: Consent. An in-depth study of recreational sport programs, including philosophy, objectives, program development, management concepts, and evaluation.

School of Social Work

The undergraduate social work program, leading to a Bachelor of Social Work (B.S.W.) degree, is a part of a comprehensive program of professional education in social work, including degree programs at the baccalaureate and master's levels, and a range of part-time and continuing educational opportunities on and off the Morgantown campus.

The School of Social Work had its beginnings in the early 1930s, when social work courses were offered in the Department of Sociology. In 1971, Social Work became an independent school; its programs are accredited by the Council on Social Work Education. Today, the school offers both the Master of Social Work (M.S.W.) and Bachelor of Social Work (B.S.W.) degrees to students preparing for professional careers.

The first decade of the school paralled the period when the scope of the mental health movement was being enlarged and emphasis was placed upon individual and group intervention and treatment. The 1960s were characterized by more emphasis on community organization, social action, political and social change throughout the school's programs. At present the School of Social Work includes some of these aspects but to a lesser degree, with three concentrations including Aging, Health/Mental Health, and Family and Children for the M.S.W. program. Baccalaureate social work education at the school has established a national reputation for a generalist practice curriculum through a WVU Undergraduate Social Work Curriculum Development Project which is a national demonstration project and a leading curriculum source model for development of baccalaureate social work programs across the country and some other countries in the world.

Social work, one of the oldest human service professions, is based upon social and behavioral science knowledge which is used to understand and provide the basis for helping individuals, groups, and communities. Social work is a profession concerned with helping people accomplish life goals and realize their full potential. Three major purposes of social work are:

1. To enhance the problem-solving, coping, and development capacities of people.

2. To promote the effective and humane operation of the systems that provide people with resources and services.

3. To link people with systems that provide them with resources, services, and opportunities.

In carrying out these purposes, social workers, along with other professionals, participate in helping to solve problems associated with financial need, social and cultural deprivation, racial injustices, physical and mental health, disadvantaged children, troubled youth, disturbed family relationships, and aging.

Faculty

John J. Miller, Ed.D. (WVU), *Professor and Dean of Social Work.*
Sung Lai Boo, Ph.D. (Fla. St. U.), *Professor and Assistant Dean for Instruction.*
Harold R. White, M.S.W. (SUNY—Buffalo), *Associate Professor and Coordinator of Field Instruction.*
Barry L. Locke, M.S.W. (Va. Cwealth U.), *Assistant Professor and Coordinator of Continuing Education.*
Ernest J. Barbeau, M.S.W. (U. Pitt), *Assistant Professor.*
Pearl Cohen, Ph.D. (U. Pitt), *Assistant Professor.*
Patty Gibbs, M.S.W. (WVU), *Assistant Professor.*
Leon H. Ginsberg, Ph.D. (U. Okla.), *Professor.* (On Leave of Absence).
John F. Isaacson, M.S.W. (U. Penn), *Associate Professor.*
Preston Jones, Jr., Ed.D. (WVU), *Assistant Professor.*
Nancy L. Lohmann, Ph.D. (Brandeis U.), *Associate Professor.*
Roger A. Lohmann, Ph.D. (Brandeis U.), *Associate Professor.*
Karen Northcraft, M.S.W. (WVU), *Clinical Assistant Professor.*
John A. Peters, M.S.W. (WVU), *Assistant Professor.*
Robert Porter, Ph.D. (Brandeis U.), *Professor.*
LeRoy G. Schultz, M.S.W. (Wash. U., St. Louis), *Professor.*
Marjorie Buckholz, Ph.D. (NYU), *Professor Emerita.*
Helen S. Ellison, M.S.W. (Columbia U.), *Associate Professor Emerita.*
Caroline T. Mudd, M.S.W. (U. Penn), *Associate Professor Emerita.*
Lester K. Beavers, Ph.D. (WVU), *Clinical Professor.*
Jennifer Bragg, M.S.W. (WVU), *Clinical Assistant Professor.*
John Claude, M.S.W. (WVU), *Clinical Assistant Professor.*
Jan Cone, M.S. (U. Denver), *Clinical Associate Professor.*
Renelle Grubbs, M.S.W. (WVU), *Clinical Assistant Professor.*
Melbourne Henry, Ph.D. (U.S.C.), *Clinical Professor.*
Phyllis Miller, M.S. (Purdue U.), *Clinical Assistant Professor.*
Jane B. Riffe, M.S.W. (U. Ky.), *Clinical Assistant Professor.*
Richard Chamberlain, M.S.W. (Howard U.), *Adjunct Associate Professor.*
Bea Hunter, M.S.W. (WVU), *Adjunct Associate Professor.*
Richard Lockhart, M.S.W. (WVU), *Adjunct Assistant Professor.*
Arlen Miller, M.S.W. (O.S.U.), *Adjunct Associate Professor.*
Paul Rice, M.S.W. (WVU), *Adjunct Associate Professor.*
Neil R. Snyder, Ph.D. (U. Pitt), *Adjunct Associate Professor.*
Larry Alkire, M.S.W. (WVU), *Adjunct Instructor.*
Richard Anderson, M.S.W. (WVU), *Adjunct Instructor.*
Sara Angotti, M.S.W. (WVU), *Adjunct Instructor.*
Ronald Bailey, M.S.W. (WVU), *Adjunct Instructor.*
John Bohley, M.S.W. (WVU), *Adjunct Instructor.*
Maryilyn Byrne, M.S.W. (WVU), *Adjunct Instructor.*
Judith Celayir, M.S.W. (WVU), *Adjunct Instructor.*
John Craig, M.S.W. (WVU), *Adjunct Instructor.*
Susan Cyphers, M.S.W. (WVU), *Adjunct Instructor.*
Linda Elkinton, M.S.W. (WVU), *Adjunct Instructor.*
Zelda Futterman, M.S.W. (WVU), *Adjunct Instructor.*
Carole Glasser, M.S.W. (WVU), *Adjunct Instructor.*

Walter Golembiewski, M.S.W. (WVU), *Adjunct Instructor.*
Robert Gribben, M.S.W. (WVU), *Adjunct Instructor.*
Margie Hale, M.S.W. (WVU), *Adjunct Instructor.*
Glenn Jeter, M.S.W. (WVU), *Adjunct Instructor.*
Aretha Kees, M.S.W. (WVU), *Adjunct Instructor.*
Don Killen, M.S. (U. Pitt), *Adjunct Instructor.*
John Klenowski, M.S.W. (U. Pitt), *Adjunct Instructor.*
Max Maloney, M.S.W. (WVU), *Adjunct Instructor.*
Thomas Martoncik, M.S.W. (WVU), *Adjunct Instructor.*
Stephen Mason, M.S.W. (WVU), *Adjunct Instructor.*
Betty Meredith, M.S.W. (WVU), *Adjunct Instructor.*
Sharon Mays, M.S.W. (WVU), *Adjunct Instructor.*
Scott Moyer, M.S.W. (WVU), *Adjunct Instructor.*
Joseph Mullen, M.S.W. (WVU), *Adjunct Instructor.*
Jerry Munsey, M.S.W. (U. Wisc.), *Adjunct Instructor.*
Robert Musick, M.S.W. (WVU), *Adjunct Instructor.*
Phyllis Nash, M.S.W. (WVU), *Adjunct Instructor.*
Patricia Nealon, M.S.W. (U. Pitt), *Adjunct Instructor.*
Ernest Nichols, M.S.W. (WVU), *Adjunct Instructor.*
Larry Patrick, M.S.W. (WVU), *Adjunct Instructor.*
Richard Rose, M.S.W. (WVU), *Adjunct Instructor.*
Herbert Rosenberg, Ph.D. (U. Pitt), *Adjunct Instructor.*
Jimmy Rubin, M.S.W. (WVU), *Adjunct Instructor.*
Fred Sias, M.S.W. (WVU), *Adjunct Instructor.*
Emma Steelman, M.S.W. (WVU), *Adjunct Instructor.*
David Strawn, M.S.W. (WVU), *Adjunct Instructor.*
Dennis Sutton, M.S.W. (WVU), *Adjunct Instructor.*
Deborah Trocki, M.S.W. (WVU), *Adjunct Instructor.*
Palmer Ulman, M.S.W. (WVU), *Adjunct Instructor.*
Edward Welp, M.S.W. (WVU), *Adjunct Instructor.*
Carol Wieland, M.S.W. (U. Denver), *Adjunct Instructor.*

Program Objectives

The objectives of the Bachelor of Social Work (B.S.W.) program are derived from the philosophy and goals of the School of Social Work and the missions of the University, the objectives of the social work profession, and the needs of people in our society. A primary objective is to offer the opportunity to prepare the student for the beginning level of professional social work practice.

As part of the overall educational experience, the student will obtain a well rounded, liberal arts education to assist in gaining personal knowledge and growth, developing skills necessary to think and to work from an objective frame of reference, and obtaining an awareness of human needs in the technologically advanced society.

In accomplishing these objectives, the student will be better prepared to take on the responsibilities necessary to be effective both as a person and a helping professional. More specifically, the purpose of the baccalaureate social work program is described in four interrelated objectives:

1. To prepare the student to be an effective and responsible social work practitioner at the baccalaureate level of competency with leadership in relation to the demands of the social work profession.

2. To prepare the student to be a social work practitioner who can practice within the state of West Virginia and the Appalachian region.

3. To contribute to the enrichment of the general curriculum of WVU by providing opportunities for students to increase their sensitivity, knowledge, and understanding of human needs, social problems, and social welfare issues.

4. To contribute to the preparation of the student who may be appropriately interested in graduate-level education in social work within the School of Social Work, other graduate social work programs, and other graduate programs of study.

Accreditation

The undergraduate social work program is accredited by the Council on Social Work Education and students are accepted, on completion of requirements for the Bachelor of Science in Social Work degree, by the National Association of Social Workers for entry into regular membership in the association.

Admission

Initial application to WVU should be submitted to the Office of Admissions and Records and should follow the same procedure as for all other freshman students.

Freshman and sophomore students who are considering social work as a major should consult the College of Arts and Sciences Academic Advising Center for help in planning their program.

To elect the social work major a student must meet the following criteria:

1. Have 58 hours of course work successfully completed.
2. Have satisfactorily completed So. Wk. 51 (Introduction to Social Work) with a grade of C or higher. So. Wk. 51, which is usually taken during the sophomore year, aims to provide the student with an opportunity to assess his/her interest in and aptitude for a career in social work.
3. Have an overall grade-point average of 2.0 or higher on a 4.0 scale.

Other students, including transfers, who wish to enter the major should communicate directly with the Social Work program in the semester before their intention to enter the program. Such students will be asked to submit a transcript of their academic records and provide additional material, which would serve to assist faculty in assessing interests and aptitudes for social work before admission to the major. An interview with the faculty member is normally required. Should the assessment prove to be satisfactory, the student will be admitted into the major. In other instances, a student may be required to enroll in So. Wk. 51 before admission to the major.

Complete information concerning WVU admission, registration, fees and expenses, regulations, etc., may be obtained in Part 2 of the *WVU Undergraduate Catalog*.

Requirements for the Degree

The undergraduate program consists of a minimum of 36 upper-division hours in social work, a minimum of 12 upper-division hours in *required social and behavioral sciences courses*, and an additional requirement of 12 upper-division hours with at least 3 hours of sociology, psychology, and political science. In addition, all social work students are required to take a minimum of 6 hours in course work dealing with racial and other minority groups from a group of courses designated in the Undergraduate Program. A total of 128 hours are required for the degree, 58 of which must be in upper-division course work. Students must have completed all required social work courses with a grade of C or better.

No foreign language is required. Students are encouraged to consult with their advisers regarding the selection of electives appropriate for their career interests.

To establish a major sequence and to qualify for graduation, the student must have spent at least two semesters and have accumulated a minimum of 30 hours as an upper-division student in the department of the student's major, or under its guidelines. Also, students must have completed all required social work courses with grades of C or better.

The specific hours requirements for graduation are:

University Core Curriculum—	*Hr.*
English Composition	6
Core Group A	12
Core Group B	12
Core Group C	12
Total	42

(In the Core Curriculum, students should take the following courses: Psychology 1, Sociology and Anthropology 1 or 102, Economics 51, and Political Science 1 or 2.)

Social and Behavioral Science Required Courses—	
Psych. 141—Introduction to Human Development	3
Soc. & A. 121—The Family *or* CDRS 112—Marriage and Family	3
Soc. & A. 211—Social Research Methods	3
Pol. S. 120—State and Local Government	3
Total	12

Additional Requirements of Social and Behavioral Science Requirements (12 hours total with at least 3 hours from each area.)

Psychology—
- 151—Introduction to Social Psychology
- 164—Personal and Social Adjustment
- 279—Community Psychology
- 281—Abnormal Psychology

Sociology and Anthropology—
- 122—The Community
- 140—Social Change in Appalachia
- 222—Community Development

Political Science—
- 135—Introduction to Policy Analysis
- 140—Introduction to Public Administration

Total 12

Social Work Required Courses—	
Lower Division	
So. Wk. 51—Introduction to Social Work	3
Upper Division	
So. Wk. 200—Social Welfare Policy and Services	3
So. Wk. 210—Social Welfare Policy and Services in Appalachia	3
So. Wk. 220—Social Work Methods 1	3
So. Wk. 222—Social Work Methods 2	3
So. Wk. 280—(Seminar) Human Behavior and Social Environment	3
So. Wk. 290—Social Work Practice 1	9
So. Wk. 291—Social Work Practice 2	9
Total	36

Minority Content Requirement—

So. Wk. 280—(Seminar) Human Diversity and Social Work Practice	3
Other course	3
Total	6
Electives	20
Total	128

Curriculum Plan

First Year:

Engl. 1	3
Engl. 2	3
Electives	2
Psych. 1	3
Soc. & A. 1 or 102	3
Pol. S. 1 or 2	3
Econ. 51	3
Core A	6
Core C	6
Total	32

Second Year:

So. Wk. 51	3
Soc. & A. 121 or CD&FS 112	3
Pol. S. 120	3
Psych. 141	3
Minority Content	3
Core A	6
Core C	6
Pol. S./Psych./Soc. & A.	3
Psych./Soc. & A./Pol. S.	3
Total	33

Third Year:

So. Wk. 200	3
So. Wk. 210	3
So. Wk. 220	3
So. Wk. 222	3
So. Wk. 280	3
Pol. S./Psych./Soc.	3
Soc. & A./Pol. S./Psych.	3
Soc. & A.	3
Racial Minority	3
Electives	6
Total	33

Fourth Year:

So. Wk. 290	9
So. Wk. 291	9
Electives	12
Total	30

The student who wishes to enter the social work program should contact the School of Social Work office in 710 Allen Hall for assistance in planning and for additional information. Freshman and sophomore students considering social work as a major should consult with pre-social work advisers in the College of Arts and Sciences Academic Advising Center for help in planning their programs.

Field Instruction Requirements

Field instruction is a key component of the total educational experience in the undergraduate program. Through the field instruction program, students "test out" in actual social work service-providing activities their ability to utilize and apply the knowledge, values, and skills which have been acquired through previous course work, the concurrent/block social work practice seminar, and other life experiences.

Students are assigned for these activities for two semesters as concurrent system or one semester as a modified block system during the senior year to a social welfare organization or agency in Monongalia or surrounding counties

which meets the criteria for participation in the field instruction program. This instruction requires the student to spend 16 hours per week for two semesters concurrent field instruction or 32 hours per week for one semester's block field instruction.

To successfully complete requirements for graduation, students must demonstrate through educationally-focused field experience activities, those practice competencies (i.e., combination of social work knowledge, values, and skills) which have been identified as suitable and necessary for entry into professional social work practice.

Social Work (So. Wk.)

51. *Introduction to Social Work.* I, II. 3 hr. *(Open to sophomores.)* Introductory course to social work and the profession. The helper and the kinds of problems and situations with which the helper may become involved are explored.

200. *Social Welfare Policy and Services.* I. 3 hr. PR: So. Wk. 51 or consent. Introduces the student to the historical background and philosophical concepts which influence the development of social welfare in America. Also, students are exposed to the specific social welfare programs and services which are utilized by the people.

210. *Social Welfare Policy and Services in Appalachia.* II. 3 hr. PR: So. Wk. 200 and 220, or consent. The second social policy course builds upon the content of the first by focusing in greater detail on the process of defining social problems, developing social policies, and implementing social provisions in the Appalachian region.

220. *Social Work Methods 1.* I. 3 hr. PR: So. Wk. 51 or consent. Theories and concepts of intervention, including prevention and rehabilitation with individuals, families, small groups, and communities are discussed. Students examine problem areas of concern to social work and various roles through which those problems can be alleviated. Emphasis on beginning skills in interviewing, observing, recording, problem identification, and analysis.

221. *Field Experience in Social Work.* II. 3 hr. PR: So. Wk. 200 or consent. *(Open to selected non-majors.)* Development of basic helping skills through a supervised volunteer or work experience in a community agency or program.

222. *Social Work Methods 2.* II. 3 hr. PR: So. Wk. 200 and 220. Helps students examine a variety of approaches to intervention, prevention, and rehabilitation. Current programs such as community action, model cities, comprehensive community mental health, organized population groups, services of departments of public welfare, extension, etc.

247. *Social Work and Human Diversity.* I, II. 3 hr. PR: So. Wk. 51 or consent. Social work practice with ethnic and religious minorities, the poor, women, Appalachians, the physically and mentally impaired, etc. Themes include stigmatization, stratification, institutional racism, sexism, and strategies for empowerment and equalization of opportunities and outcomes.

280. *Seminar.* I, II. 1-6 hr. PR: Consent. Current issues in social work. Weekly seminars in topics of human sexuality, poverty, and income security, physical and mental health, housing, racism, children and families, women, aging, and delinquency.

290. *Social Work Practice 1.* I. 9 hr. PR: So. Wk. 210, 222. Social Work Practice is field instruction and a key course within the undergraduate program for the student's total educational experience. Enables the student to master and to apply social work practice theory and practice principles through engaging simultaneously in learning activities in a field placement and a concurrent practice seminar.

291. *Social Work Practice 2.* II. 9 hr. PR: So. Wk. 290. Continuation of So. Wk. 290.

Part 4
INTERDISCIPLINARY PROGRAMS

Center for Extension and Continuing Education

The pioneers in the land-grant movement intended to establish institutions through which knowledge and learning would become an effective part of the daily lives of American people. West Virginia University is such an institution.

The Center for Extension and Continuing Education develops educational programs to meet the needs and concerns of adults and youth throughout the state. The center's educational programs are established within the general framework of five broad program areas: Off-Campus Credit Program; Continuing Education Programs; Agriculture, Forestry, and Community Development; Personal and Family Development; and 4-H Youth Development. In addition to the WVU main campus, one of the most intensively used facilities to support these program areas is the unique continuing education and conference center known as Jackson's Mill. The State 4-H camp, the Mill is regarded as a focal point for off-campus, "away from home" classes and conferences of varying lengths and objectives.

Program determination focuses on analysis of problems, interests, and concerns of people. As new knowledge and technology become available, informational and instructional programs are planned and conducted to meet clientele interests. Program development is a continuous interaction process involving dialogue, joint decision making, and coordination among staff members of the center, other units of the University, the U.S. Department of Agriculture, the various Extension committees, and advisory groups representing the clientele. Program faculty at a WVU Extension office in each county provides direct access for extending educational programs to the people.

Financing comes from state appropriations to the University, federal funds, county commissions, and county boards of education.

Division of Off-Campus Credit Programs

This division coordinates the WVU graduate and undergraduate off-campus course program.

Undergraduate Courses

Generally, WVU offers undergraduate-level, off-campus courses for credit only in specific situations where expressed needs cannot be met by local undergraduate colleges. Such courses normally are offered on a contractual basis. Fees for undergraduates are $20.00 per credit hour for West Virginia residents and $84.00 per credit hour for nonresidents. In addition, there is a $20.00 per course per semester off-campus resources fee.

For further information, write to: Division Leader for Off-Campus Credit Programs, Knapp Hall, West Virginia University, Morgantown, WV 26506.

Graduate Courses

Approximately 180 graduate-level, off-campus courses are offered each semester through the WVU graduate centers located at Jackson's Mill, Parkersburg, Potomac State College, Shepherd College, and West Liberty

State College. Course offerings are designed to enable students to fulfill the requirements of specified master's degree programs.

Master's programs available through the centers are reading, secondary classroom teacher, education administration, elementary classroom teacher, early childhood education, safety studies, speech communication, technology education, physical education, and special education. The Master of Business Administration degree is available at the Parkersburg and West Liberty centers. Courses offered are approved by the appropriate department chairperson and academic dean and by the Division Leader for Off-Campus Credit Programs. Graduate-level courses are also approved by the Graduate Studies Office.

Students taking off-campus courses for graduate credit must satisfy all requirements for admission to the University and, before registering, must file with the WVU Dean of Admissions and Records complete official transcripts of record. It is the responsibility of students to ascertain from the appropriate college or school and department the specific requirements for degree candidacy.

Fees for the off-campus graduate-level courses are $30.00 per credit hour for West Virginia residents and $123.00 per credit hour for nonresidents. In addition, there is a $20.00 per course per semester off-campus resources fee.

Library Resources

Library and laboratory facilities for off-campus courses must be approved by the Division Leader for Off-Campus Credit Programs and, in case of courses for graduate credit, by the Graduate Studies Office. Books for use by off-campus students may be borrowed from the WVU Library upon the order of the Division Leader for Off-Campus Credit Programs, subject to the approval of the Library Committee. Postal charges must be paid by the individual or groups for whom the books are borrowed.

Division for Continuing Education

The Division for Continuing Education expands lifelong learning opportunities among all people by offering research and educational programs related to personal, career, professional, and social development. The division includes the Conference Office, Continuing Education Unit (CEU) Program, Business and Management Extension, Cultural and Clergy Education, Fire Service Extension, Institute for Labor Studies, and Special Interest Programs for adults.

Conference Office

The Conference Office collaborates with academic units, faculty and staff, student organizations, and community and professional groups to provide a multitude of educational activities. Typical programs include the annual Fine Arts Music Camp, New Student Orientation, West Virginia Vocational Educators Conference, and Eastern Gas Compression Roundtable.

Continuing Education Unit Program

The Continuing Education Unit (CEU) is used for the measurement, recording, accumulation, transfer, and recognition of participation by adults in non-credit programs. The CEU program gives recognition on a national basis to persons continuing their education and keeping up-to-date in their chosen fields by participating in WVU-sponsored, non-credit continuing education.

Business and Management

The Business and Management Extension program offers educational activities designed to meet the management information needs of both public and private enterprises.

Cultural and Clergy Education

Community leadership for today and an appreciation of yesterday's heritage come from Cultural and Clergy Education. Needs of the clergy are met in many ways, including the annual Appalachian Regional School for Church Leaders held at WVU. An appreciation of our culture is taught in a variety of heritage classes, and through support of the Mountain State Art and Craft Fair—attracting thousands to Ripley each year.

Fire Service Extension

Training for West Virginia's fire fighters is offered by Fire Service Extension. The fundamentals of fire suppression are taught in basic, advanced, and regional schools conducted throughout the state. In addition to fire suppression and rescue training, programs for fire department officers and instructor training programs for training officers and field instructors also are offered.

Institute for Labor Studies

The Institute for Labor Studies conducts educational and research programs for workers and their organizations. Subject matter ranges from skill courses, such as steward training, collective bargaining, work measurement, union administration, job evaluation, and contract administration, to a liberal arts curriculum covering such subjects as labor and economy, government and society, and labor history. Research ranges from collective bargaining studies and attitude surveys, to economic analysis.

The division works with academic departments, faculty, and community leaders to develop activities to serve special interest needs. Formats include day and evening short courses, seminars, and intensive workshops. Programs are designed for career update, relicensure, professional development, and personal enrichment.

For further information, call 293-4013, or write Division Leader for Continuing Education, Knapp Hall, West Virginia University, Morgantown, WV 26506.

Division of Agriculture, Forestry, and Community Development

The Division of Agriculture, Forestry, and Community Development has six structured program units: Animal Sciences, Plant Sciences, Forestry, Resource Management, Community Development, and Energy. Each program unit conducts educational programs and provides technical assistance to enhance rural development in West Virginia.

The division's primary objective is to collect, translate, and diffuse to clientele knowledge that has been generated within WVU and similar institutions and organizations in West Virginia and neighboring states. Many opportunities exist for students to support local program activities in a variety of subject-matter areas.

Areas of specific interest to the division in pursuit of its educational objectives are: (1) improvement of animal, crop, and horticultural production

through breeding and management; (2) improvement of pasture and forage production levels; (3) proper utilization of land and conservation of land and natural resources; (4) economical weed and pest control techniques; (5) environmentally and economically sound forestry production, harvesting, and utilization schemes; (6) maintenance of air and water quality; (7) expansion of animal and solid-waste management programs; (8) expanded outdoor recreation and tourism programs; (9) improvement of the leadership and decision-making capabilities of adult and youth community groups, organizations, agencies, and public officials to enhance their efforts to secure better housing, transportation, social services, water and sewage systems, recreational facilities, and local government; (10) energy conservation; and (11) efficient use of West Virginia's natural resources—renewable and non-renewable; and (12) improved use of community resources in rural development programs.

Division of Personal and Family Development

The Division of Personal and Family Development provides educational programs designed to assist individuals and families to improve their quality of life. Programs are developed to facilitate identification of needs, decision making, and more effective utilization of resources. Focus areas include management of personal and family resources; promotion of nutritious, safe, and attractive meals; strengthening interpersonal relationships within the family and community; providing attractive and safe home environments; and planning and caring for textiles and clothing. Program thrusts for the division include: personal and family resource management, leadership development, and nutrition education.

Money management skills are emphasized in all areas of programming since food, health, housing, and clothing consume the major portion of an individual or family's take-home pay. Management processes as resources are emphasized when dealing with societal changes. These competencies are important at all stages of the life cycle but are especially important to young adults establishing life-styles, making decisions about acquiring skills and material goods, and extending their interaction with the total environment.

Opportunity is provided through the West Virginia Extension Homemakers program for more than 15,000 women and men to participate in organized clubs in every county. Development of leadership capacities is a major goal with opportunity for participation at local, area, and state conferences and seminars designed to enhance individual and organizational leadership skills.

Programs designed for limited income families include the Expanded Food and Nutrition Program. Utilizing community-based paraprofessionals, the program seeks to improve the general nutritional well being of limited income families in West Virginia. A strong food preservation program prevails with emphasis on the dissemination of accurate, scientifically based information.

Division of 4-H-Youth Development

The overall mission of the 4-H-Youth Development Division is the development of youth individually and as responsible and productive citizens.

Four-H capitalizes on two distinct and contrasting variations on traditional school learning environments. One variation is the community-based, family involved, 4-H club learning unit. With support from community

volunteers such as teachers and parents, 4-H clubs provide learning experiences in over 100 different subjects. In addition to subject teaching, 4-H clubs also provide a laboratory for the study of group process, group decision making, and a real life experience in politics at a level meaningful to younger children. Under special federal funding, nutrition education is offered through 4-H programs designed to reach West Virginia's disadvantaged population.

A second strategy is the "away from home" type of programming represented in 4-H camping and 4-H exchanges between counties, states, and countries. These learning environments play an important part in the development of a young person. With the adult-centered and highly integrated cultural style of many Appalachian families, the provision of a new environment for self exploration is useful in the development of a positive self concept.

In recent years, 4-H has become increasingly involved in traditional classroom learning environments. Enrollments in these single subject, relatively short-term (six lessons) learning experiences have soared. This shift is probably more a function of changes in the world of adults, both professional and volunteer, than in changes of the needs and interests of young people. Decreased numbers of full-time homemakers and increased competition for volunteers' time are contributing factors in this shift.

Jackson's Mill

Jackson's Mill is one of the nation's unique educational facilities. Operated by the Center for Extension and Continuing Education, Jackson's Mill became the nation's first State 4-H Camp in 1924. Today it serves as a statewide conference center for leadership development.

Boasting of such youth-oriented activities as 4-H Roundup, Dairy Cattle Shows, and band camps, the Mill also provides the setting for numerous conferences, seminars, credit courses and workshops appealing to all ages.

To many, Jackson's Mill represents more than just "a place." It's a tradition, a spirit, a contemplative kind of facility that reaches out to people. It delivers educational opportunities in a most unique way.

Applied Research, Evaluation, and Development

The Office of Applied Research, Evaluation, and Development designs and conducts interdisciplinary research relating to the social and economic development of the state. Research topics include human resource development, transportation, coal mine health and safety, energy use and conservation and natural resource development and management. The office also conducts educational needs assessments and program evaluation research for the University's Center for Extension and Continuing Education, other West Virginia University units, state and federal governmental agencies, and private organizations.

Water Research Institute

The Water Research Institute program is designed to obtain knowledge needed to gain the greatest benefit from the water resources of West Virginia. Research involving faculty members and graduate students is done on projects centered in several departments of WVU.

Information and Educational Technology

The Information and Educational Technology Unit delivers information to the public through the mass media (radio, television, and newspapers); produces communication support materials such as publications, slide/tape sets, videocassettes, and exhibits; and teaches communication skills that result in expanded, more efficient, and more effective faculty communication approaches and programs. Undergraduate and graduate internships working with the unit are available through the School of Journalism and the Graphic Design Department in Art (College of Creative Arts).

Gerontology Center

The West Virginia University Gerontology Center highlights the University's commitment to increasing understanding of the aging process and supporting efforts to improve the quality of life for elderly persons, particularly the rural elderly of Appalachia. Under the Director, Dr. Lucille Nahemow, the Gerontology Center promotes and coordinates interdisciplinary teaching, research, and service in gerontology at WVU. University units involved in teaching and research in human aging include the College of Arts and Sciences, the College of Human Resources and Education, the College of Agriculture and Forestry, the School of Physical Education, the School of Social Work, the School of Medicine, the School of Nursing, and the Center for Extension and Continuing Education.

Because the growth of the elderly segment of our population is affecting all aspects of U.S. society, a focus on gerontology promises to enhance the professional qualifications of students in a variety of disciplines, increasing employability of students in human service and health science areas, academic settings and in business and the private sector as well.

The Gerontology Center offers a 17-credit-hour Undergraduate Certificate program in gerontology for students who wish to obtain a foundation of knowledge in gerontology while pursuing a degree in another field. Requirements for the Certificate include MDS 50—Introduction to Gerontology (3 hr.), MDS 250—Issues in Gerontology (3 hr.), and a total of 11 hours in field experience and electives selected from an approved pool of aging-related courses offered in a number of disciplines.

A Practitioner Certificate in gerontology based on continuing education credits is available for persons who are currently working with the elderly.

Further information and assistance in academic program planning in multidisciplinary gerontology, and registration forms may be obtained from Betty Maxwell, Administrative Assistant, WVU Gerontology Center, B-8 Knapp Hall, Morgantown, WV 26506, (Telephone: 304-293-2081).

Oak Ridge Associated Universities

West Virginia University is a sponsor of Oak Ridge Associated Universities (ORAU), a nonprofit, education and research management corporation of 43 colleges and universities. ORAU, established in 1946, conducts programs of research, education, information, and human resource development for a variety of government and private organizations. It is particularly interested in three areas: energy, health, and environment.

Details concerning Oak Ridge Associated Universities are on pages 364-365 of the *1983-84 WVU Graduate Catalog*.

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Beechurst PRT station; Armstrong Hall on right, Woodburn Hall in background.

Relaxing along Cheat Lake.

Stewart Hall

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